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DOCUMENTING CHILDREN'S LEARNING: ASSESSMENT AND EVALUATION IN THE PROJECT APPROACH

BY

DARLENE ANNE WILLIAMS

A thesis submitted to the Faculty of Graduate Studies
and Research in partial fulfillment of the requirements
for the degree of Master of Education

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Abstract

Assessment and evaluation of students' work have always seemed an overwhelming responsibility for teachers. Models of education which advocate a didactic style of teaching have typically relied on standardized, criterion-referenced and paper-and-pencil tests to assess and evaluate student achievement. Given the move toward more student-centered classrooms, which emphasize process as well as product, alternative assessment and evaluation methods are needed.

One such student-centered methodology is the Project Approach . A project is defined as an in-depth study of a real-life topic, such as: Pets, The Grocery Store, Trees, etc. While involved in project work, children have an opportunity to engage in purposeful and relevant activities to further their understanding of the topic of study. Traditional testing methods cannot accurately or effectively document, assess and evaluate the learning that occurs through a project.

The purpose of this study was to examine how assessment and evaluation could be carried out within the context of a project on "Building." The following questions shaped this study: Which tools and techniques can be used to assess and evaluate student work in the project approach? What features of project work provide opportunities for student assessment and evaluation? What does project work highlight concerning student achievement that wasn't highlighted through more systematic teaching methods?

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Chapter One

Introduction

Background

My desire to rethink and improve my assessment and evaluation practices grew out of my commitment to the project approach. Introducing projects into my classroom allowed me to witness and appreciate qualities in my students that had previously gone unnoticed and untapped. During project work, students thrived in an atmosphere which gave them freedom to study topics that interested them and then allowed them to design and choose activities suited to their interests and needs. Displays of ingenuity abounded. I remembering being forced to abandon fixed notions of students' capabilities in favour of more generous and malleable descriptions. Jeremy was one of my students whose project work insisted that I take another and different look at him. The following is an excerpt from my teacher's journal that I kept during the course of my class' first experience with project work.

January 31, 1996

I now realize that first impressions of students can be extremely limited and flat.. I always thought that I had a pretty good feel for them, I was mistaken. It's not so much that what I thought about them was inaccurate, it's just that it was so incomplete.

My experience with project work has forced me to reevaluate my conceptions about my students and their capabilities. Given the freedom to explore and to use their interests and talents in a less inhibiting environment, students who typically seemed to have a lot of difficulty doing more traditional school work have actually blossomed and flourished during project work. How did I miss this? Did these qualities come about because of project work or were they there

all along just waiting for an opportunity to show themselves? I think they've always been there, I just didn't notice them. When I think back to some of their first term report card comments I am very humbled. There is so much more I could have said.

Jeremy is a good example. He was terribly messy, disorganized and slow at finishing assignments. He needed a lot of monitoring and encouragement in order to complete some pretty simple and straightforward activities. However, during the buildings project I was blown away by his ability to organize, design and build complicated structures as well as his problem solving skills. He didn't need any encouragement from me to persevere.

For one of his activities, Jeremy chose to design and build a very elaborate Styrofoam replica of his house. He began by drawing a complex and detailed illustration.. He used this drawing as a model for his structure. He then cut out and shaped all the Styrofoam pieces accordingly. He was meticulous. A great architect in the making! Jeremy also brought additional materials from home to complete his design:. pieces of fabric, wood, carpet, tin, etc. He labeled all the rooms and features and added important details both inside and outside, such as doorbells, porch lights, ceiling moldings, baseboards, electrical outlets, etc. Because his building was so large and intricate (he had used at least twenty different pieces and sizes of Styrofoam to build his house), at the end of the day it was necessary for him to take it apart and put it away until he could come back to it again. I was very concerned that Jeremy would never be able to reassemble it. As I watched him contemplate his options, I remember thinking that it won't be long before I have to intervene and give him some suggestions. How presumptuous! Jeremy didn't need my help. Left to his own devices, Jeremy came up with a wonderful system for putting his building back together quickly and efficiently. He placed small coloured circles on the ends of the Styrofoam pieces that were supposed to fit together. All he had to do was match up the same coloured dots end to end and the building was up. How ingenious!! If Jeremy had been constantly forced to engage in more teacher directed activities, I may never have

witnessed the many skills and aptitudes that were at play when Jeremy built his Styrofoam house. Our project on buildings gave Jeremy the opportunity to showcase his skills and be seen in a new and more enlightened context by his teacher. Thank you Jeremy!

Jeremy's story is not unique. It's only one of many that regularly occurred during project work. Students whom I had labeled as weak and unmotivated delighted me with displays of enthusiastic determination and understanding. "Average" students revealed that they had much more potential and creativity than previously given credit for. Similarly, students deemed intellectually gifted displayed abundant evidence of undetected aptitudes and competencies.

My current assessment practices were clearly inadequate at capturing and highlighting the myriad and depth of abilities being displayed as students spiritedly carried out their project work. I witnessed daily the diversity of skills being employed and it was mainly through my observations that others came to appreciate the work of my students. I relied heavily on anecdotal notes, student samples and photos to tell my story of the students' achievement. I needed and wanted to explore additional and alternative ways of understanding and recording my students' experiences with project work. I realized that I was missing a lot more than I was capturing. If I wanted to gain more insights into students' learning and share the richness of my students' project work with parents and other teachers, I would need better assessment and evaluation practices.

This study represents my attempt to discover, design and implement selected assessment and evaluation tools and techniques in an attempt to better appreciate and articulate students' learning experiences with project

work. I readily recognize that this study is only a beginning. Many more possibilities for student assessment and evaluation of project work exist. As I become more adept at implementing projects into my classroom, I will continue to explore and experiment with new assessment and evaluation strategies that can help me discover the unrealized potential in all my students as illustrated above in the story of Jeremy.

This paragraph offers a brief description of the succeeding chapters in this thesis. **Chapter Two** is an introduction to the project approach, which includes a brief history and description, as well as support for the project approach in the literature. **Chapter Three** is a literature review of assessment and evaluation, with particular emphasis on alternative classroom assessments. **Chapter Four** focuses on the case study by furnishing important information about the nature and structure of my research on assessment and evaluation in the context of project work. **Chapter Five** summarizes the classroom study of the Building Project by highlighting the primary events during the three phases of the project. **Chapter Six** comprises the bulk of this thesis. In this chapter all the various assessment and evaluation tools and techniques are described, as well as their application in the classroom, strengths and limitations and how they were used to assess and evaluate during the Building Project. **Chapter Seven** represents a final reflection on assessment and evaluation. In this chapter I share my insights and thoughts concerning assessment and evaluation within the context of project work and offer some ideas for additional assessment and evaluation opportunities.

Chapter Two

An Introduction To The Project Approach

A Brief History of Project Work

Although the project approach to teaching and learning has received considerable attention in the past decade, largely due to the work of Katz and Chard, the idea of the project approach or method is not new. Towards the middle of the nineteenth and beginning of the twentieth century the grounds for the project approach were being laid. Several prominent pedagogues: Friedrich Froebel, William James, G. Stanley Hall, Francis Wayland Parker, John Dewey and William Heard Kilpatrick all hinted at the need for a new direction in child education. They proposed a new model of education based upon a child-oriented curriculum. The primary goal of this new educational model was to honor the interests and needs of the child by basing

> "...the work of the child upon his own experiences, to lead him to gather data for thought from his personal observation, and to inspire him to interpret these experiences and observations independently and originally, to relate them with each other and with all previously gained knowledge, and to apply them to the interests and acts of his daily life. . ."
> (Davis, 1894, p. 730-731).

In short, the child was to play a key role in determining and shaping his education. The ideas put forth by these educational prophets were indeed revolutionary and led to the launching of several important educational movements: the kindergarten movement, the nature study movement, the new psychology movement, the child study movement, the Herbartian movement and the laboratory schools movement. These movements all contributed to the emergence of "new schools" during the period 1890-1930 (DuCharme, 1993). The "new schools" implemented a more responsive and child-centered curriculum that emphasized learning through experimentation and discovery. The project method for teaching and learning evolved as a

result of the educational ideas set forth in these "new schools."

Among the ideas of these influential educators, Dewey's and Kilpatrick's visions of child education contributed perhaps the most to the evolution of the project approach philosophy. Dewey and Kilpatrick both ardently believed and promoted the idea that schools should be based primarily on child-initiated projects, ones which engage the child in "purposeful and meaningful" activity. In other words, children in school should be involved in activities and pursuits which stem from their interests and needs rather than from those of the teacher or some distant school board. According to Dewey and Kilpatrick, activity within the classroom should have an intrinsic focus for the child rather than the current extrinsic one. Curriculum should emphasize real-life experiences and rid itself of the artificial busy work which seemed to dominate so many classroosm. Kilpatrick (1918) asserted that the ultimate purpose of school should not only prepare one for life, but be life itself: "As the purposeful act is thus the typical unit of the worthy life in a democratic society, so also should it be made the typical unit of school procedure" (p. 327).

Kilpatrick's publication of an article in the Teachers College Record in 1918 entitled The Project Method was "the beginning of a new wave of excitement in the field of education" (DuCharme, 1993, p. 27). In his article, Kilpatrick, building upon the ideas of Dewey and himself, proposed that projects be used in order to enable children to initiate purposeful activity and deepen their understanding of the world around them. Numerous educators embraced Kilpatrick's ideas and implemented project based curriculum in their schools. Despite all the interest and attention given to Kilpatrik's project method, in 1928, Rugg and Shumaker (in DuCharme, 1993, p. 31) stated that "95% of American schools were made up

of formally organized subjects of study, systematized lessons, rigorous examinations, set practice exercises and recitations." The majority of American children were not experiencing the project method philosophy in their classrooms.

The project method still had its advocates. In the 1930's, on the tail end of the American progressive education movement, Lucy Sprague Mitchell embraced Dewey and Kilpatrick's philosophy by establishing the Bank Street College Of Education. She opened a laboratory school which placed project work at the heart of its curriculum. At this school, children were encouraged to learn about their environment through active hands-on investigation. The college also became an important training ground for aspiring project method teachers. Through this college, the philosophy of active child-centered learning found a new home.

The open education philosophy of the 1960's that occurred in North America provided another important impetus in the emergence of the project approach. Bruner's discovery learning theory and Thelen's group investigations ideology both helped to open up elementary classrooms. Curriculum became less regimented and more responsive to children's interests. Sitting at desks and filling in worksheets was seen as stifling and unproductive. Instead, children were being taught in a more informal atmosphere that emphasized hands-on learning in a real-life context. Unfortunately, the philosophy behind open education was often misinterpreted and poorly implemented in the classroom. When test scores began to fall, pandemonium broke out. In the late seventies, open education was identified as the culprit and a return to a more traditional educational approach was advocated and quickly adopted.

Although the inclusion of projects in most North American schools was

short-lived, the pedagogical ideologies behind the successful approach found expression in both Britain and Italy. In 1967, the British government released an educational document known as the Plowden report which endorsed learning that "grows out of what interests the learner, rather than what interests the teacher" (Silberman in Katz and Chard, 1989, p. 8). In response to this document, English infant schools engaged children in projects in order to ensure that the child was indeed at the center of the learning process. Italy's story is much the same. For the past 30 years, teachers in Reggio Emilia have been successfully implementing projects exclusively with preschool children (Edwards, Gandini and Forman, 1993).

In the late 1980's, inspired by the success of the English infant schools in Britain, Katz and Chard began formulating their own vision of the project approach. With the publication in 1989 of Engaging Children's Minds: The Project Approach, Katz and Chard have succeeded in bringing serious attention to and discussion of the project approach ideology and methodology. As a result of their work, a project approach philosophy is once again making a resurgence in North American classrooms.

Description of Project Work (Katz and Chard, 1989)

What is the Project Approach?

The project approach embodies both practical teaching strategies and a philosophy of teaching and learning. Katz and Chard (1989) define a project as an "in-depth study of a particular topic" (p. 2). They assert that children learn best when they have the opportunity to study a topic that interests them in a meaningful, interactive and informal context. The project approach encourages children to "interact with people, objects, and the

environment in ways that have personal meaning to them" (Katz and Chard, 1989, p.3). By interacting with materials and people in their environment, children develop a deeper understanding and appreciation of the topic being explored.

The Phases of a Project

A project has three distinct phases which follow the initial planning process.

Preliminary Planning:

The teacher has the primary role in the initial stages of a project. She begins by selecting a topic of study based on the children's interests, curriculum and local resources, materials and people available. She then spends time brainstorming her own experiences, knowledge and ideas about the topic in order to map out possible activities, experiences and field studies to be engaged in during the course of the project. She collects all these ideas and organizes them into a topic web which is used as a reference and added to throughout the project.

Phase One: Beginning The Project

Phase one is devoted to discovering what the children already know about the topic. Discussions undertaken by the class allow the children the opportunity to share their past experiences and knowledge. The children are then encouraged to represent their experiences and knowledge in a variety of ways: drawing, writing, construction, dramatic play, etc. The children also create their own topic web in which they organize and categorize their ideas, experiences and knowledge about the topic. In the process of finding

out what her students already know about the topic, the teacher helps them develop questions and activities to further their understanding. These questions and activities developed by the children shape phase two of the project.

Phase Two: Developing the Project

Phase two involves finding out new information about the topic. The teacher arranges opportunities for the children to engage in field work. During field work, children make field trips to topic-related sites and guest visitors are invited into the classroom to share their expertise. The children are expected to record detailed notes of their observations during their field work. In addition, the teacher provides classroom resources such as books, real objects and reference material to facilitate further investigation of the topic. The teacher helps the children suggest and develop activities aimed at answering their research questions. Each child is then responsible for representing what he or she is learning and to share his or her learning with the class. Representational activities take various forms such as Venn diagrams, charts, posters, reports, models, etc. The topic web is continually expanded as new learning and experiences take place. Children's work is attractively displayed throughout the classroom in order that others benefit from seeing examples of quality work and the information about the topic researched by their classmates.

Phase Three: Concluding the Project

Phase three is concerned with celebrating the learning and experiences which occurred during the project. The teacher and the children arrange a culminating activity which allows the children an opportunity to share with

others what they learned during the course of the project. An important part of concluding the project involves reflecting back on it. To encourage reflection, the teacher gives the children an opportunity to review and evaluate the project.

The Place of Project Work in the Curriculum

Despite the many benefits to children from engaging them in project work, Katz and Chard (1989) are quick to suggest that project work should not constitute the whole curriculum (p. 10). They write that project work is best seen as "complementary to the more formal, systematic part of the curriculum..." (Katz, 1994, p. 2). Systematic instruction: (1) helps children acquire skills; (2) addresses deficiencies in children's learning; (3) stresses extrinsic motivation; and (4) allows teachers to direct the children's work, use their expertise, and specify the tasks that the children perform. Project work, in contrast: (1) provides children with opportunities to apply skills; (2) addresses children's proficiencies; (3) stresses intrinsic motivation, and (4) encourages children to determine what to work on and accepts them as experts about their needs (Katz, 1994, p. 2). Project work creates an opportunity for children to integrate and apply in a meaningful and purposeful manner many of the skills and concepts learned through more systematic instruction. Both systematic instruction and project work have an important place in the curriculum.

Selecting a Project Topic

The selection of a suitable topic of study in project work is crucial. Project work involves the study of real-life topics, topics which are familiar to the children and ones in which they already have some experience and interest. The topic of a project is "a real phenomenon that children can investigate directly rather than mainly through library research" (Katz, 199?, p.2). In addition, it is essential that the information the children will be accumulating be worthwhile and meaningful. For example, children living in a coastal community might engage in projects about ocean animals and plants, seashells, boats, or the fishing industry. In contrast, children living in a large city might focus their projects on buildings, traffic, local businesses, construction sites or pollution. Because project work engages the children in an extensive in-depth study based on hands-on activities, it is essential that local materials, resources and people be readily available to them as primary sources of information. Katz (1990) suggests that the following criteria be considered when selecting a topic:

1. The subject matter is real, is related to the children's own everyday, first-hand experience, and will be useful to the children in later life experiences. It should be familiar enough that children can show initiative in exploring it and teachers can identify experts, plan field trips, and find resources for activities.
2. It is more suitable for learning *in* school than *out of* school.
3. It allows for integration of a range of subjects or disciplines, i.e., science, social studies, mathematics, music, art, reading, etc.
4. Real objects rather than abstract concepts are studied
5. There is sufficient potential for exploration and investigation over a period of at least a week, ideally longer.
6. Opportunities are provided for problem solving, decision making, collaboration, cooperation, writing, drawing, using the computer, painting, making models, construction, and dramatic play.
7. Parents can contribute in some way. (p.154)

Teacher's Role

In the project approach, the teacher assumes many roles. Foremost, the teacher acts as a facilitator, guide and consultant. No longer seen as a dispenser of knowledge, the teacher assumes the role of resource person. She ensures that the children have access to pertinent and informative materials and people. She arranges field studies, supplementary activities and guest visitors. As children work on their various project activities, the teacher constantly circulates- watching, listening, asking or answering questions, challenging, offering suggestions, or lending a hand.

Another role the teacher assumes is that of mediator. The teacher plays out this role by engaging the children in frequent class discussions. During these discussions, the children have an opportunity to voice their ideas, opinions and concerns and to raise questions concerning the topic being studied. In the project approach, the children are also given many opportunities by the teacher to share their learning both in formal and informal settings. Through this sharing of work, the children come to appreciate one another's talents and further their understanding of the topic.

Establishing high expectations regarding student work is another role undertaken by a project approach teacher. In this way, the teacher acts as a "quality control manager." Through frequent modeling and discussion sessions, the teacher is able to convey her expectations concerning project work. The teacher, along with the students, also develops specific descriptions for certain project activities. The children are then responsible for producing work which fulfills these descriptions.

In addition to acting as a facilitator, mediator and quality control manager, the teacher also takes the role of recorder. It is the teacher's

responsibility to document children's learning. By collecting work and displaying work samples, observing children engaged in the various activities of a project and initiating conversations with children about their work, the teacher is able to effectively assess and evaluate each child's progress. She takes this information and uses it to make instructional decisions.

Themes, Units, Projects: Some Important Distinctions

Although there are similarities between projects, themes and units, project work does have at least three very distinct features. Perhaps project work's most distinctive quality is that it is a collaborative effort between the teacher and the children. Unlike themes and units which usually consist of planned activities and lessons, project work evolves in response to the children's interests and learning needs. The children's questions determine to a large extent the direction that the project takes. The children and the teacher collaboratively select the areas of investigation in the project, plan the activities and decide what materials are needed. Because of this collaboration, no two projects ever look alike.

Another distinguishing feature of project work concerns the depth at which a topic is studied. In project work, a topic is studied intensely, usually over a long period of time. In contrast to units and themes which usually have a shorter, predetermined duration, project work allows for and encourages a more extensive study of the selected topic.

Lastly, project work readily encourages and solicits the involvement of parents and the community. Whereas units and themes tend to rely on books as the primary source of information, project work takes the children out to the community to do their research. In project work, field work serves as the principal means of collecting data.

Finding Support for the Project Approach in the Literature

Using the project approach as a way of learning and teaching has been advocated by many educational leaders. Howard Gardner is one of them (Wolk, 1994 p. 45, Burchfield, 1996 p. 6, Shores, 1992 p. 59 and Borgia, 1993 p.152). In his book, *Multiple Intelligences* (1993), Gardner makes strong arguments for the integration of subjects, cooperative learning and involvement of community (pp. 68-80), three educational goals also found in the Project Approach. When asked to describe his ideal classroom, much of what Gardner said characterized project work. "Almost all the work in mathematics, social studies, reading and writing and science takes the form of student projects. Students explore particular aspects of material in depth, addressing problems that confront professionals in the discipline" (*Multiple Intelligences*, 1993 p. 75).

In much the same way that project work allows a child to pursue his or her own interest in a particular topic, Gardner's vision of the ideal school also recognizes the importance of acknowledging the child's educational interests and needs. "What I do intend to stress is the importance of taking seriously each child's own proclivities, interests, and goals, and, to the maximum extent possible, helping the child to realize those potentials" (Gardner, 1993, p. 74). Like the project approach which emphasizes the study of real-life topics and authentic activities in order to help children make sense of the world around them, Gardner also recognizes the need to focus on real skills and activities. "We need to reconfigure curricula so that they focus on skills, knowledge, and above all, understandings that are truly desirable in our country today. And we need to adapt those curricula as much as possible to the particular learning styles and strengths of students"

(p. 79).

In a chapter of *Multiple Intelligences*, entitled "A School of the Future," Gardner acknowledges the importance of involving the community in a child's education. Continuing to describe his ideal school, Gardner writes,

> The second half of our school day is a natural extension of the first. During this time, students and teachers venture out into the community for further contextual exploring and learning. The younger children and their teachers often travel to a children's museum, a playground, or a special participatory demonstration at the local theater, symphony, or art museum. These excursions differ from typical field trips because classes return to the same spots many times over the course of the year. Students can continue projects begun previous visits (perhaps working on a sculpture at the local art museum or continuing study on the life cycle of the crabs at the aquarium) or hone their skills in favorite activities (examining butterfly specimens at the children's museum or playing the timpani at the symphony demonstrations). Teachers prepare students for these experiences by planning related in-class projects and discussions, and debrief them afterward in paralleled ways. Whether at the museum or our enriched school environment, children are allowed to explore freely and encouraged to ask questions (p. 76).

In accord with the project approach, Gardner's ideal school understands the important contributions that the community can make to a student's education. "Community members volunteer to share their expertise in some craft or occupation by working with a small group of students who have expressed interest in it...The important point here is that students can explore interests and abilities not necessarily tapped by the typical school curriculum" (p. 77). Like project work, Gardner's educational proposal extends children's learning well beyond the limitations of a set and static curriculum. In a project approach classroom, the walls come down and the community is invited in to share expertise, enthusiasm and experience. Project work recognizes the valuable contributions that the community can

make.

The strongest support for project work from Gardner comes from his theory of multiple intelligences. Gardner proposes that human beings do not have one overall intelligence but are capable of at least seven different and independent forms of intellectual accomplishment: linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal. Unfortunately, schools tend to only focus on and value linguistic and logical-mathematical intelligences. Children who have strong language and math skills do very well in the school system. Others whose strengths lean more toward art, music, sports, social skills or introspection don't usually fare as well. Project work helps students succeed because they have an opportunity to use all their intelligences when engaged in project work. Children's work can take the form of writing, drawing, drama, construction, research, etc. Because the children are closely involved in negotiating and designing the activities in project work, each child has the opportunity to pursue activities and engage in experiences which further develop his or her favored intelligences and work on those that need strengthening. Like Katz and Chard, Gardner acknowledges that project work is not a panacea for all that is wrong in today's classrooms. They all recognize that some skills and concepts are best taught in a more teacher directed or sequential manner. In summing up the reasons for engaging students in project work, Gardner states that projects, when done well, can serve a number of educational purposes particularly well that couldn't be served any other way.

> They engage students over a significant period of time, spurring them to produce drafts, revise their work, and reflect upon it; they foster positive cooperativeness, in which each student can make a distinctive

> contribution; they model the kind of useful work that is carried out after the completion of school, in the wider community; they allow students to discover their areas of strength and to put their best feet forward; they engender a feeling of deep involvement or "flow," substituting intrinsic for extrinsic motivation (Csikszentmihalyi, 1990); and perhaps most importantly, they offer a proper venue in which to demonstrate the kinds of understanding that have (or have not) been achieved in the course of the regular school curriculum (*Multiple Intelligences*, 1993, p. 118).

Recent findings from brain research studies also support the inclusion of project work in the curriculum. Recognizing that what a child experiences in early life plays a crucial role in shaping the intellect of that child (Begley, 1996), brain researchers advocate a more intellectually stimulating curriculum that includes project work. "If more administrators were tuned into brain research, scientists argue, not only would schedules change, but subjects such as foreign languages and geometry would be offered to much younger children. Music and gym would be daily requirements. Lectures, work sheets and rote memorization would be replaced by hands-on materials, drama and project work" (Hancock, p. 58). Involving children in project work should be seen as one way to ensure that children have optimal educational experiences aimed at developing their brains to the best of their potential.

Today's classrooms are filled with students of varying backgrounds, needs and abilities. Many school districts practice a policy of complete integration of all special needs students. Perhaps foremost among these special needs students are the young children with attention deficits. These children typically exhibit a short attention span, overactivity and impulsive responding. They often have great difficulty in an exclusively teacher directed classroom and need the informal, flexible open-endedness of project work.

> The child with ADHD may be considered quite troublesome, for example, in a highly structured academic setting, with desks placed in rows and all work to be accomplished in one's seat. In contrast, in the open-classroom setting where cooperative learning is encouraged and children are expected to move about and collaborate with others, the child with ADHD may be less distinctive and disturbing to others (Jacob, O'Leary and Rosenblad, 1978 in Landau and McAninch, 1993, p. 51).

Engaging attention deficit children in project work which stimulates and interests them, could provide an important educational component for these children.

Not only can the project approach help attention deficit students achieve success, but it can also be an effective approach to the curriculum for underachievers. A recent study indicates that student-centered enrichment projects guided by a caring teacher can help underachievers turn around the cycle of academic failure (Baum, Renzulli and Hebert, 1994). Lack of an appropriate curriculum was identified as one of the principal reasons for underachievement. Curricular approaches sensitive to students' interests and strengths are needed. The study clearly showed that the approaches that worked best with underachievers "center on students, accentuate students' strengths, and value their interests" (Baum, Renzulli and Hebert, 1994, p. 51). Increased self-esteem, academic self-efficacy and overall motivation were the benefits to students after having completed a meaningful project (Baum et al. 1989, Baum and Owen 1988, Emerick 1992, Whitmore 1980 in Baum, Renzulli and Hebert, 1994).

Educators are not only concerned with the damaging effects of an inappropriate curriculum, but they're also now beginning to realize the detrimental effects of a curriculum with too much prescribed content. By expecting students to cover so much curricular content, we force them to move quickly from topic to topic without ensuring that learning has taken

place. Teachers are forced to be more concerned with coverage than with students' understanding of the material presented. According to Gardner, understanding means having the capacity to take knowledge learned in one setting and apply it appropriately in a different setting (Brown, 1993, p.4). He maintains that study after study indicates that most students do not understand what they have been taught precisely because of our obsession to "cover the curriculum." Teachers assume that a correct answer implies understanding. "Students read a text, they take a test, and everybody agrees that if they say a certain thing it will be counted as understanding" (Brown, 1993, p. 4). In order to ensure that students do understand what is being taught, Gardner professes that we are better off to pursue fewer topics more deeply rather than many topics superficially.

> The greatest enemy of understanding is coverage. As long as you are determined to cover everything, you actually ensure that most kids are not going to understand. You've got to take enough time to get kids deeply involved in something so they can think about it in lots of different ways and apply it -- not just as school but at home and on the street and so on. Now, this is the most revolutionary idea in American education -- because most people can't abide the notion that we might leave out one decade of American history or one formula in math or one biological system. But that's crazy, because we now know that kids don't understand those things anyway. They forget them as soon as the test is over -- because it hasn't been built into their brain, engraved in it. So since we know unambiguously that the way we do it now isn't working, we have to try something else (Brown, 1993, p. 7).

Rosegrant, like Gardner, likens the American curriculum to "Trivial Pursuit." "The curriculum is too often a series of brief encounters or superficial exposures that are aptly referred to as "covering" or, more simply, "doing," as in "We did the farm in the fall; we are doing the zoo in the spring. Such a shallow approach to study undermines children's attention

spans and dispositions to persist." (Bredekamp, 1993, p. 15). In contrast, projects provide opportunity for extended, in-depth coverage which leads to a deep understanding of the topic (Bredekamp, 1993, p. 14). By engaging children in project work, we give them time to become truly proficient in some aspect of the project. This proficiency has lasting effects.

Jane Healy, another prominent educational researcher, recognizes the danger of using traditional teaching methods on today's children. In her book, Endangered Minds (1990), Healy states:

> We are rearing a generation of "different brains" and that many students' altering academic skills -- at various socioeconomic levels -- reflect subtle but significant changes in their physical foundations for learning. These fundamental shifts put children in direct conflict with traditional academic standards and the methods by which they are usually conveyed. Particularly at risk are abilities for language-related learning (e.g., reading, writing, analytic reasoning, oral expression), sustained attention, and problem solving (p. 46).

The children that present themselves in today's classrooms are very different from yesterday's children. Divorce, latch-key kids, television, video games, exposure to toxins and deteriorating cultural values have all contributed to creating a new generation of students whose brains respond differently and who need different teaching and learning strategies from those of the preceding generation. In describing some criteria for creating effective classrooms for these "different brains," Healy is, in effect, describing much of what happens when a child is engaged in project work.

> Children need stimulation and intellectual challenges, but they must be actively involved in their learning, not responding passively while another brain --their teacher's or parent's -- laboriously develops new synapses on their behalf! Any activity which engages a student's interest and imagination, which sparks the desire to seek out an answer, or ponder a

question, or create a response, can be good potential brain food (p. 73).

Project work fits the criteria deemed essential by Healy to create classrooms that promote intellectual development. In order to create environments which foster intellectual development, Healy advocates cooperative learning, hands-on activities and projects.

In addition to finding support in Gardner's theory of multiple intelligences, recent research on brain development, ADHD and Healy's call for curriculum that's more appropriate and effective for the changing brains of today's children, the project approach to teaching and learning also finds support among the ideas of language development experts. In Mind in Society (1978), Vygotsky writes about the need for reading and writing to have purpose, to be "relevant to life."

> But the teaching should be organized in such a way that reading and writing are necessary for something...Reading and writing must be something the child needs. Here we have the most vivid example of the basic contradiction that appears in the teaching of writing...namely, that writing is taught as a motor skill and not as a complex cultural activity. Therefore, the issue of teaching writing...necessarily entails a second requirement: writing must be "relevant to life" -- in the same way that we require a "relevant" arithmetic (p. 117).

Graves, Goodman, Atwell and Calkins are among current language educators who also believe in engaging children in real-life reading and writing experiences. They too advocate the necessity of creating authentic language experiences in the classroom. Children must have real opportunities to use language in purposeful and meaningful ways that parallel how language is used in "the real world."

Upholding the beliefs of Graves, Goodman, Atwell and Calkins, Edelsky

(1991) suggests a way to distinguish between authentic reading and writing activities and simulated ones. She maintains that when it comes to teaching reading and writing in the classroom, it is the focus of the lesson that indicates whether the activity is authentic or not.

> In teaching written language exercises (rather than real written language use), one does not use language with the learner: one administers it to the learner. A telltale sign that one is teaching language exercises rather than language use is the focus of the lesson. With language exercises, the focus is most often on the conventions relating to some language point (e.g., spelling or punctuation) or on the language act itself (e.g., reading, pronouncing). With real language use, the focus is most often on what one is doing with the language -- the ideas being wrestled with, the goal being sought. Reading and writing are like that outside the classroom (p. 72).

The project approach is conducive to the application of language in real-life situations. As children carry out their project work they engage in many authentic reading and writing activities. Writing letters, reading newspapers, articles, pamphlets, books, etc., conducting interviews, making phone calls, designing posters, sending faxes, introducing guests, organizing data on charts, diagrams and graphs are just a few of the ways in which the children are called upon to apply their reading and writing skills in an authentic context. As Edelsky advocates, language use in project work definitely emphasizes the "doing."

Chapter Three

Literature Review Of Assessment and Evaluation

Why We Assess Students

Assessment has always been an overwhelming responsibility and concern for teachers. Since the first student set foot in a classroom, teachers have collected, analyzed and shared information concerning student progress. Originally conceived to inform teachers about student performance, student assessment now has a much larger mandate and audience. Today, assessment has many masters. All levels of the educational hierarchy rely on assessment data. The reasons for assessing students are as varied as the parties interested in student assessment. Grant (1993) has identified the following as some of the primary users and uses of student assessment (p. 111).

Teachers use assessment to:
*diagnose students' learning needs
*adjust instruction and curriculum
*reinforce learning
*group students for instruction
*control student behavior
*prepare and report grades
*select students for special services

Students use assessment to:
*define their classroom performance
*discover teacher expectations
*set personal academic goals
*make decisions about self-concept
*gauge effort levels
*clarify learning concepts

Parents use assessment to:
*plan for future educational expenses
*determine need for extra tutoring
*structure after-school activities
*compare student's perceived ability with actual achievement

In addition to teachers, students and parents, principals, school boards, policy makers and the public also use student assessment information to make decisions and form judgments about curriculum needs, program funding and the effectiveness of schools and teachers, among other things (Grant, 1993, p. 111).

Stiggins (1997) also identifies similar users and uses of data obtained from student assessments (p. 24). He does, however, include several additional reasons why teachers assess students. Adding to Grant's list, Stiggins claims that teachers also assess students in order to motivate them, to communicate achievement, affective or behavioral expectations and to provide test taking experience (in Schultz, 1994, p. 15). Although teachers assess students for a wide variety of purposes, Schultz (1994) claims that the most important reason for student assessment is the "...evaluation of individual students for judging their progress. This evaluation includes the grading and reporting functions, but comprises providing feedback on student progress to students and teachers, and to parents more generally" (p. 27).

Stiggins (1997) recognizes that different purposes require different assessment plans. He states that not all users and uses of assessment information are equally important. Stiggins, like Grant, identifies students as the most important users of assessment results. All decisions concerning assessment need to take into account the various ways in which students may be both positively and adversely affected by the assessment data.

How We Assess Students

Assessment is almost continuous in most classrooms. From the time students arrive in the morning, to the sound of the afternoon dismissal bell, teachers engage in a myriad of assessment activities. In fact, so dominant is the role of assessment that Stiggins estimates that "the typical teacher can spend as much as one-third to one-half of his or her professional time involved in assessment-related activities (1997, p. 12). This includes time spent designing, developing, selecting, administering, scoring, recording, reporting, evaluating and revising various assessment instruments (Stiggins, 1988, p. 364). Given the amount of time, energy and effort devoted to student assessment, one readily recognizes the central role that assessment plays in education.

Teachers gather information about their students in many ways. Two distinct forms of assessment currently dominate student assessment practices:

1.) standardized tests and 2.) classroom assessment strategies

Limitations Of Current Assessment Practices

Concern over student assessment practices is not new. Every decade seems to usher in a new wave of educators determined to underscore the prevailing inadequacies of student assessment (Schultz, 1994, p. 32).

Standardized Tests

Standardized tests refer to "mass-produced, machine-scored tests designed to measure skills and knowledge that are assured to be taught in a reasonable standardized way" (Hart, 1994, p. 113). They first made their appearance in classrooms in the early part of this century because of a

perceived need to obtain "objective" data concerning the academic achievement of students. Although teacher-created assessments clearly dominate classroom assessment practices and teachers make little use of information regarding students obtained from standardized tests and large-scale assessment programs (Schultz, 1994, p. 1), standardized testing remains very pervasive in the school system. Nearly all North American students are subjected to some type of yearly standardized testing (Schultz, 1994, p. 4-6). Excerpts from a children's story entitled, *First Grade Takes A Test*, by Miriam Cohen, poignantly illustrates many of the limitations of standardized tests.

First Grade Takes A Test

a story by Miriam Cohen

A lady from the principal's office came to the first grade. She had a big pile of papers with little boxes all over them. She smiled at the first grade. "We have some tests for you," she said. "Oh, good," said Anna Maria. "Now we can find out how smart we are." Their teacher told first grade how to do the test. She said, "Read the questions carefully. Then take your pencil and fill in the box next to the right answer. You must work quickly. But do not worry -- you can do it. Ready! Begin!" George looked at the test. It said:

Rabbits eat

☐ lettuce ☐ dog food ☐ sandwiches

He raised his hand. "Rabbits have to eat carrots, or their teeth will get too long and stick into them," he said. The teacher nodded and smiled, but she put her finger to her lip. George carefully drew in a carrot so the test people would know. Sammy read:

What do firemen do?

☐ make bread ☐ put out fires ☐ sing

He poked Willy. "Firemen get your head out when it's stuck," he said. "My uncle had his head stuck in a big pipe, and the firemen came and got it out." But none of the boxes said that. On the test there was a picture of Sally and Tom. Sally was giving Tom something. It looked like a baloney sandwich. Underneath it said:

☐ Sally is taller than Tom.

☐ Tom is taller than Sally.

Jim wondered what being tall had to do with getting a baloney sandwich. And was it really a baloney sandwich? It might be tomato....Jim took a long time on that one. Suddenly the teacher said, "The time is up!" "I'm not finished!" cried everyone *except Anna Maria. But the teacher had to take the tests away.*

Although meant as a story, Cohen's description of the children's test taking experience highlights several shortcomings long associated with standardized tests. Of primary concern is the usefulness of the test results. Meisels (1993) states that if we are looking to find significant insights into a child's strengths and difficulties, data from standardized tests offer few clues.

> The data may inform us that a child does not have strong letter knowledge, but they cannot tell us which letters the child specifically knows or does not know. They may tell us about a child's overall ability to recognize shapes, objects, or sound-symbol combinations, but they will not be able to tell us how children combine these elements into the intellectually more demanding task of reading. Test results may tell us a child's percentile ranking on a specific subtest, but they cannot tell us whether the child's performance reflects an inability to follow the complex test directions or whether the child did not have mastery of the information or skill (p. 35).

As evidenced in the story, children's test scores are poor indicators of their abilities. The children in the story exhibited many skills and attitudes not

assessed, nor valued by the test. What the test does highlight about the children is their inability or refusal to think like a test maker.

Miesels (1993) offers that the reason standardized tests are of limited value is because the content of these tests is too narrow and restrictive, focusing almost exclusively on low-level skills.

> Group administered tests focus on the acquisition of simple facts, low-level skills, superficial memorization, and isolated evidence of achievement.... These group-administered, objectively scored, paper-and-pencil tests are of limited value. Their content is generally abstract, verbally mediated, and potentially biased against children unfamiliar or uncomfortable with test-like activities and with middle-class manners and mores (Stallman and Pearson, 1990 in Meisels, 1993, p. 35). Children taking these tests are assessed on isolated skills in settings that are devoid of context, rather than being evaluated on tasks in natural settings in which they are asked to use what they know and have experience with previously (p. 35).

The issue of content was readily apparent *in First Grade Takes A Test.* Struggling to find connections between their lived experiences and the questions they confronted on the test, the children became confused and frustrated. Unfortunately for the children, their realities were not reflected in "the correct answer."

Shepard (1989) shares Meisels concerns regarding the limitations of standardized tests. She too claims that the assessment of basic skills dominate the construction of standardized tests. "Test construction is further constrained by the emphasis on basic skills, limiting the "height" as well as the depth and breadth of permissible content" (p. 5).

Meisels' skepticism regarding the validity of standardized test results is echoed by Wiggins. Wiggins (1989a) is concerned that traditional tests place too much emphasis on assessing a student's ability to memorize knowledge and too little on a student's ability to understand, process and

apply knowledge, which he calls "habits of mind." Because standardized tests are one shot tests, they are thereby unable to assess progress, a vital piece of assessment information.

> Traditional tests - as arbitrarily timed, superficial exercises (more like drills on the practice field than like a game) that are given only once or twice - leave us with no way of gauging a student's ability to make progress over time. We typically learn too much about a student's short-term recall and too little about what is most important: a student's habits of mind.... As the word habit implies, if we are serious about having students display thoughtful control over ideas, a single performance is inadequate. We need to observe students' repertoires, not rote catechisms coughed up in response to pat questions (p. 705-706).

Another long-standing criticism of standardized tests concerns the influence they have in determining classroom instruction. Because the results of standardized tests often have serious consequences ("Newspapers rank schools and districts by their test scores. Real estate agents use test scores to identify the "best" schools as selling points for expensive housing. Superintendents can be fired for low scores, and teachers can receive merit pay for high scores" (Shepard, 1989, p. 4), it's not surprising that these test scores have significant pedagogical implications. Several studies have provided ample evidence indicating that standardized testing does indeed influence classroom instruction (Shepard, 1989, p. 5). Teachers feel pressure to "teach to the test" in an attempt to ensure that their students produce acceptable test results.

> In one study, for example, elementary teachers reported taking time away from science and social studies to devote more time to tested math skills (Salmon-Cox 1982, 1984 in Shepard, 1989). Darling-Dammond and Wise (1985 in Shepard, 1989) also found that tested areas were taught at the expense of untested areas: McNeil (1988 in Shepard, 1989) documented that minimum proficiencies dictated by competency tests overwhelmed class time. In addition, Darling-Hammond and Wise (1985 in Shepard,

> 1989) found that even within the bounds of test-driven content there was "dumbing down" of instruction. Teachers taught the precise content of the tests rather than underlying concepts; and skills were taught in the same format as the test rather than as they would be used in the real world (Shepard, 1989, p.5-6).

In addition to the content, usefulness and influence upon classroom instruction, Jarolimek and Foster (1997) identify several additional objections commonly cited with respect to the use of standardized tests:

1. They may be used to label children as high or low achievers, thereby encouraging a self-fulfilling prophecy.
2. They are not able to accommodate adequately the local variations that are found in the curricula of American schools.
3. They not only test school achievement but life experiences and out-of-school learning of all types; that is, the tests have a sociocultural bias favoring children who come from middle and upper socioeconomic levels and whose families have a better than average background of education.
4. They rely on reading skill, and therefore, they often do not provide good measures of concept attainment and knowledge of informational content (p. 340).

Despite the numerous limitations and opportunities for misuse and misinterpretation of test results, standardized tests can be of some use. "Standardized-test results constitute a useful tool for the teacher in revealing general strengths or weaknesses in the achievement of individuals or of an entire class" (Jarolimek and Foster, 1997, p. 339). The problem arises however when we draw conclusions about higher-level thinking skills based on these low-level thinking skills test scores. Standardized tests can have a place in the classroom, as long as they are not asked to do more than they can.

Teacher-Created Assessments

Teacher-created assessments dominate classroom assessment practices. As previously stated, although standardized tests are imposed on practically every North American student on a yearly basis, the results are of little interest to classroom teachers (Schultz, 1994, p. 1). Teachers much prefer to develop and implement their own assessment strategies. Because teachers rely almost exclusively on classroom assessments to gather information, to make judgments, to plan instruction and to report student progress, it is essential that these assessments be effective and reliable measurements of student achievement. Unfortunately, research on teacher assessment practices indicates that they are often not effective or reliable. Like standardized tests, classroom assessment practices also have many flaws.

One of the principal concerns highlighted in the research involving classroom assessment practices pertains to teachers' selection of assessment strategies. Research indicates that teachers' repertoire of assessment strategies is often very restrictive. Although teachers have many options available to them when it comes to selecting classroom assessments, they typically rely on a very limited number and static set of assessment techniques. Some assessment activities are informal, subtle and unobtrusive, while others are more formal, blatant and observable. Asking questions, interpreting answers, listening to conversations, observing students at work, examining homework, collecting assignments, looking through portfolios and giving teacher-made quizzes and tests are just a sample of the many ways in which teachers can collect information about their students. Despite the variety available, teachers actually make use of very few of these strategies. Webster (1987) (in Schultz, 1994, p. 21), [in

accordance with results from a study by Stiggins and Bridgeford (1985) (in Schultz, 1994, p. 21)], reports that there is "limited variation in teachers' assessment practices across grade levels and subject areas." The type of assessment process chosen relates closely to the age of the student and the subject being taught (Marso and Pigge, (1992), in Schultz, p. 22). At the lower grade levels, assessment tends to be less formal. Teachers rely mostly on work samples and observation to collection assessment information about their students. In contrast, at the higher grades, teachers take a more formal approach to assessment. They place much more emphasis on paper-and-pencil testing and less on work samples and observation (Marso and Pigge (1992) in Schultz, 1994, p. 22). As for subject areas, math and science teachers tend to formally test their students much more frequently than do teachers of other subject areas, relying heavily on teacher-made tests to collect assessment data (Marso and Pigge (1992) in Schultz, 1994, p. 22). When teachers limit the ways in which they collect assessment information about their students, they also limit the quality and reliability of those data. A variety of assessment sources is needed in order to capture a broader and more accurate understanding of a student's capabilities.

Current assessment practices of teachers tend to be restricted not only in quantity, but in quality as well. Teacher-created tests, a prevalent assessment instrument, are often poorly designed. Stiggins (1988), reports that teacher-developed paper-and-pencil tests are currently dominated by questions that rely almost exclusively on memorization. Students are asked to simply recall and repeat back facts and information. Even though class instruction may have focused on higher-order thinking skills, teacher-developed tests, like standardized tests, focus on and reward low-level skills. According to Stiggins (1988), the real danger of these poor quality

assessments lies in the message sent to students. Being able to repeat recalled material is favored over understanding. Students quickly recognize the high priority placed on recall and the regrettable exclusion of higher-order thinking skills. "...(P)oor-quality assessments that fail to tap and reward higher-order thinking skills will inhibit the development of those skills" (Stiggins, 1988, p. 365).

Even more subjective measures of student achievement can have harmful effects on students when not constructed and implemented appropriately. Attempting to both expand their repertoire of assessment strategies and to gather more accurate and specific assessment information, some teachers have begun using performance assessments in their classroom. Performance assessments generally require the student to perform a specific skill upon which his or her proficiency is then assessed. When asking students to demonstrate specific skills, teachers need to have very explicit expectations and criteria. In addition, teachers need to ensure that they have shared these expectations and criteria with their students before they are asked to demonstrate the designated skill. Stiggins' research indicated that "many teachers lack a clear sense of their expectations about student performance and therefore lean on nonexistent or vague criteria inadequately communicated to students" (1988, p. 365). Although performance assessments possess the potential to collect valuable information concerning student achievement, the information received from these assessments is usually unreliable due to the dubious manner in which it was collected.

Summarizing data from several research studies on teachers' assessment practices, Stiggins (1988) paints a very bleak picture indeed concerning classroom assessment. "The only supportable conclusion that we can draw from the available research is that teachers are neither trained nor

prepared to face the rigorous demands of classroom assessment. This is especially true of beginning teachers" (p. 365). McLean (1985) (in Schultz, 1988, p. 36), concurs with Stiggins findings. He too has little faith in teachers' ability to effectively assess students. In a study done on the state of assessment in Canadian classrooms, McLean determined "that classroom assessment is more of a craft than a science, and teachers learn this craft through trial and error and experience" (Schultz, 1994, p. 36). Like Stiggins, he concluded that teachers' skills in evaluation are indeed very weak.

Not only are researchers troubled concerning teachers' assessment practices, but not surprisingly, teachers voice dissatisfaction as well. Stiggins (1988) reports that teachers are "generally concerned about the quality of their assessments, and they often lack confidence in them" (p. 365). Teachers recognize that their assessment practices are inadequate and ineffective and report the need for practical help (Stiggins and Bridgeford, 1985 in Stiggins, 1988, p.365).

Despite the poor quality of classroom assessments, teachers are not solely to blame. Assessment plays a primary role in a teacher's professional duties, yet teacher training programs devote very little or no time to this topic (Stiggins, 1988 and Schultz, 1994). If a course is offered, it tends to emphasize the construction of paper-and-pencil tests, the administration of standardized tests and the mathematical logistics of assessment.

> Most teacher training programs do not require a course in educational measurement to graduate, and many programs do not even offer one. Those courses that are offered emphasize developing paper-and-pencil tests, using standardized tests, and understanding the statistical aspects of assessment. Daily assignments, performance assessments, tests that accompany textbooks and oral questions - all key strategies of classroom assessment - are often virtually ignored (Stiggins, 1988, p. 364-365).

Not only is little time allocated to assessment during teacher training, but classroom teachers don't generally receive any additional information or support on appropriate and effective assessment practices either. Stiggins (1988) reports that inservice training in classroom assessment is rare (p. 365). Once in the classroom, teachers report that they look to their colleagues and rely on personal experience to guide their assessment practices (Stiggins, 1988, p. 365). Few school districts have trained assessment specialists and if they do these specialists tend to be almost exclusively preoccupied with the administration and management of standardized tests, thereby ignoring classroom assessment (Stiggins, 1988, p. 365).

Poor quality assessments have serious implications for both teachers and students. When teachers use poor assessments, they receive inferior and inaccurate information about their students and, therefore, they make inadequate and inappropriate instructional and evaluative decisions. These decisions can have a negative impact on students, particularly in the early and middle grades (Stiggins, 1988, p. 366). When students continually receive erroneous information concerning their achievement, they begin to lose sight of their talents. "In short, low-quality assessment can eventually cause potentially successful students to give up on themselves and leave school" (Stiggins, 1988, p. 366). Ironically, student assessment, poorly constructed and implemented can have detrimental effects for everyone in the classroom, the exact opposite of its intention.

The Need For Better Classroom Assessments

Recognizing the need for better, clearer and more effective assessment practices in the classroom, educational groups have proposed new standards both in the United States and here in Canada concerning student assessment. *The Standards for Teacher Competence in Educational Assessment of Students* appeared in 1990 in the United States, and *Principles for Fair Student Assessment Practices for Education in Canada* was published in 1993. The primary objective of these standards is to provide teachers with a set of principles and guidelines that can be employed when considering or using classroom assessment strategies. These standards have been approved and endorsed by many educational organizations. Much overlap exists between the American and Canadian standards. The five general principles from the Canadian document are as follows:

A) Assessment methods should be appropriate for and compatible with the purpose and context of the assessment.

B) Students should be provided with a sufficient opportunity to demonstrate the knowledge, skills, attitudes, or behaviors being assessed.

C) Procedures for judging or scoring student performance should be appropriate for the assessment method used and be consistently applied and monitored.

D) Procedures for summarizing and interpreting assessment results should yield accurate and informative representations of a student's performance in relation to the goals and objectives of instruction for the reporting period.

E) Assessment reports should be clear, accurate, and of practical value to the audiences for whom they are intended.

These principles and guidelines aim to improve the quality of classroom assessment currently practiced in our schools. Not all guidelines are

applicable to every assessment instrument or situation, but consideration for the overriding spirit and philosophy should ensure more effective and equitable student assessment. These standards put forth for student assessment possess enormous potential to bring assessment back where it belongs: in the hands of the student and teacher. As Grant Wiggins (1989a) reminds us, assessment should be much more than just the mere recording of students' responses to stimuli. Assessment needs to highlight not only the response, but, to be most effective, it must also shed light on the thought processes behind the response.

> The root of the word assessment reminds us that an assessor should "sit with" a learner in some sense to be sure that the student's answer **really** means what it seems to mean. Does a correct answer mask thoughtless recall? Does a wrong answer obscure thoughtful understanding? We can know for sure by asking further questions, by seeking explanation or substantiation, by requesting a self-assessment, or by soliciting the student's response to the assessment (p. 708).

The work of Howard Gardner on multiple intelligences also testifies to the need for better classroom assessments. Unlike earlier theories of intelligence which claim that individuals possess one fixed intelligence, Gardner proposes that all individuals have at least seven distinct intelligences: linguistic, logical-mathematical, spatial, musical-rhythmic, bodily-kinesthetic, interpersonal and intrapersonal (Nelson, 1995, p. 26). Current assessment practices tend to favour only linguistic and logical-mathematical intelligences. Students strong in math, science and language usually do well. However, students with strong intelligences in other areas rarely have the opportunity to exhibit their talents when current classroom assessments are imposed on them. Great variety exists in the way in which

students acquire knowledge and demonstrate the personal meaning they have created. Unfortunately, current assessment practices neither acknowledge, nor value this diversity in student learning. "Gardner's theory is a dream come true for teachers--because it means intelligences can be nurtured" (Nelson, 1995, p. 26). But if we continue to teach to tests, we are only nurturing limited skills and eliminating those students who don't do well in the traditional testing areas. McLean and Lockwood (1996) maintain that, in light of the current theories about intelligence, assessment practices must address all the intelligences if they are to be useful. "To be successful with all students, instruction and assessment need to draw on more than linguistic or logical-mathematical intelligences and subscribe to the assumption that all students can learn" (p. 16).

This call for improved classroom assessment practices comes none too soon. Not only are educators beginning to rethink the role of assessment in their classrooms, but they're also beginning to advocate and implement instructional practices which demand new assessment techniques. There's definitely a movement afoot to encourage teachers to move away from the more traditional didactic style of teaching toward a more eclectic style that emphasizes guiding students to construct their meaning of the world around them rather than leading them to repeat preconceived notions and ideas. There exist more effective and efficient assessment techniques available to teachers. In exploring some of the possibilities, we acknowledge that current practices don't suffice. They are ineffective, misleading and short-sighted. In fact, what they cannot assess turns out to be more important than what they can assess.

Alternative Classroom Assessment Practices

The term alternative assessment is really a misnomer. Alternative assessment practices are only alternative when compared to the standardized tests, multiple-choice tests and paper-and-pencil tests that presently dominate our classrooms. In actuality, alternative assessments are really assessment instruments and techniques that many teachers have been aware of and, have, at one time or another, used in their classrooms. However, with the big push for accountability and the political popularity of percentile scores, alternative assessments have been replaced by more "reliable" methods.

The label "alternative assessment" covers such terms as performance-based assessment, authentic assessment and direct assessment. All of these labels describe a shared goal which is to "finally ask children to think when we test them, not just recall facts....ask students to apply their learning to relevant situations...." (Brown, 1994, p. 87). Alternative assessment brings us back to the primary purpose of assessment, which is "to help the student learn and to help the teacher instruct" (Wiggins, 1997, p. 24). Winograd (1994) also believes that assessment needs to first serve students and teachers. He maintains that alternative assessment practices have this ability because they inherently focus on and serve the needs of both students and teachers.

> The movement to alternative assessments is based upon the understanding that students and teachers are the most critical audiences and that assessments should be administered with an eye on learning. In other words, students and teachers engage in evaluation so that students can take control of their own learning and teachers can improve their instruction. The important point here is that alternative assessments should first focus on serving students and teachers (p. 421).

Besides being an invaluable tool for students and teachers, another advantageous facet of alternative assessment is its inherent ability to assess both process and product, as opposed to more traditional assessment methods which tend to emphasize product only. Alternative assessments "stress the importance of examining the processes as well as the products of learning. They encourage us to move beyond the "one right answer" mentality and to challenge students to explore the possibilities inherent in open-ended, complex problems and to draw their own inferences" (Herman, Aschbacher and Winters, 1992, p. 7). Alternative assessments stress active participation on the part of the student in both learning and assessment situations.

Alternative assessments, like traditional assessment instruments, often require the assessor to make inferences about a student's learning. However, McLean and Lockwood (1996) believe that the inferences made from alternative assessments are much more reliable and justifiable because students are forced to show their learning. They cannot simply hide behind the flawed construction of a test, or ambiguous evaluation criteria. The assessor needs to make no guesses about a student's real intentions. "Because alternative assessments are designed to have students do or demonstrate what they know, they provide a direct link for an inference concerning what they have learned. The influence of guessing that is present in any multiple-choice assessment is eliminated, and thus, potentially more accurate inferences are possible" (p. 39).

But how do we create an authentic alternative assessment task? Wiggins (1992) offers us some guidelines. "The aim is to invent an authentic simulation, and like all simulations, case studies, or experiential exercises, the task must be rich in contextual detail" (p. 27). The assessment task

must be meaningful and relevant. It must connect with the student. Wiggins (1992) is very definite about the need to design the task to suit the student. "An assessment task will be meaningful to the extent that it provokes thought and thus engages the student's interest. We need to design performances, not drills" (p. 28). In order to ensure the authenticity of the assessment task, Wiggins (1989a) maintains that several other conditions need to be met: No time constraints, some collaboration with others is encouraged, the task is unobtrusive, the task is intellectually challenging and that the task emphasizes using knowledge rather than recalling knowledge (p. 711). Wiggins (1989a) believes that the whole point of assessment is to provide the student with an opportunity to "show off what they can do" (p. 711). Shepard (1989) shares many of Wiggins' convictions regarding the construction of alternative assessments. She states that tests "should acknowledge more than one approach or one right answer and should place more emphasis on uncoached explanations and real student products" (p. 7). If we're really interested in understanding what students can do, we need flexible assessment practices.

Knowing that alternative assessment must meet the needs of both teacher and student by informing them about both product and process, and that alternative assessments must be part and parcel of everyday classroom life, we need to now look more closely at specific examples of what constitute alternative assessment techniques. In general, alternative assessments require a student to demonstrate the knowledge, skill or attitude being assessed. "This demonstration may take the form of an essay, exhibition, portfolio, or other type of assessment, but they all require more than simply marking a correct answer on an answer sheet" (McLean and Lockwood, 1996, p. 34). The following is a list of some of the more popular

types of alternative assessments:

*portfolios
*self-evaluation
*peer-evaluation
*checklists,
*one-on-one interviews
*direct observation
*writing tasks
*exhibitions and demonstrations
*presentations and performances
*learning logs
*journals
*long-term projects
*video tapes of student work

All of these tools help paint a more accurate, vivid and multidimensional portrait of the learner. They are even more powerful when used in conjunction with one another and used over the course of the entire school year. "A longitudinal approach to assessment puts the results of any one assessment into perspective. As the same time, multiple measures of the same outcomes provide alternative views of performance that combine to create a more complete picture of student achievement" (McLean and Lockwood, 1996, p. 120). Wiggins (1989a) also attests to the need to collect data over a long period from multiple sources in order to gain valuable insights into a student's habits of mind.

> To prove that an answer was not an accident or a thoughtless (if correct) response, multiple and varied tests are required. In performance-based areas we do not assess competence on the basis of one performance. We repeatedly assess a student's work--through a portfolio or a season of games (just like a hockey or football team would be assessed). Over time and in the context of numerous performances, we observe the patterns of success and failure and the reasons behind them (p. 705-706).

Collecting data over an extended period of time allows for a more accurate portrait of the learner. The picture they produce figuratively resembles a school-year videotape rather than a Polaroid snapshot (Maeroff, 1991, p. 275). In addition, "they provide the means for evaluating the quality of children's work in an integrated manner. They are flexible enough to reflect an individualized approach to academic achievement. They are also designed to evaluate many elements of learning and development that standardized test do not capture well" (Brown in Meisels, 1993, p. 36). Journals, learning logs, portfolios, projects, etc. are all capable of obtaining student assessment data over extended periods of time. In essence, alternative assessments recognize and pay homage to the uniqueness of each student as she or he progresses throughout the year.

As opposed to more traditional forms of assessment which make no room for student reflection, alternative assessments inherently involve the student in the assessment process. Glazer (1994) states that when we exclude students from the assessment process, we, in turn, rob them of the opportunity to gauge their own progress and assess their own learning. We make children dependent on teachers to tell them how they're doing. "The teacher dependence is so well demonstrated when you talk to children about their school achievement. "I know I'm smart because I got a good score on a test," said one nine-year-old. "My teacher gave me a good grade. That's how I know I did well," another chimed in. Standardized tests are created for adults and children are dependent upon adults to interact with the tests" (Glazer, 1994, p. 152). Although Glazer was referring specifically to standardized tests, her concern about children's dependence on teachers to inform them about their achievement applies just as readily to other

traditional forms of student assessment. Children need to be involved in the assessment process. With traditional forms of assessment, teachers do the "doing." (Glazer, 1994, p. 152), with alternative assessments, students are central to the assessment process.

Despite their many advantages, alternative assessment strategies do have some drawbacks. These assessments tend to be time-consuming, labor-intensive and difficult to establish reliability and validity amongst assessors. Although these drawbacks pose serious concerns, they are workable. Maeroff (1991) states that, yes, these are obstacles, but not insurmountable ones. He likens alternative assessment strategies to scoring methods used in some competitive sporting events. Sports such as diving and figure skating have come up with some very effective ways to judge subjective tasks.

What ultimately distinguishes alternative assessments from traditional assessments? McLean and Lockwood (1996) believe that alternative assessments "...make explicit and formal what was previously implicit and informal. They also encourage teachers to articulate their instructional goals clearly, to ensure alignment between their goals and current views of meaningful teaching and learning, and to gather systematic evidence to guide their instructional efforts" (p. 7).

No amount of testing, nor any one particular type of assessment is capable of telling the whole story about a student's achievement, but some are definitely more capable than others. The limitations of traditional assessment methods are well documented. Educators need to now look toward alternative assessment practices to help paint a fairer and more accurate picture of students' capabilities and gain a better understanding as to how they can best assist the students in their classroom.

The Project Approach and Alternative Assessment Practices

Designing science experiments, writing letters inviting guests to the classroom, researching topics of personal interest, constructing models, collecting data, interviewing experts, taking field notes, observing demonstrations, developing activities and sharing knowledge and experiences are just some of the ways in which children engaged in project work showcase their learning. Traditional assessment practices are unsuited to assessing the diversity of skills, attitudes and aptitudes exhibited during the life of a project. When the philosophy of the classroom is child-sensitive, "assessment data are the foundation for instructional planning" (Rhodes and Shanklin, 1993, p. ix). A project approach classroom is a child-sensitive classroom. The evolution of the project depends heavily on the children's interests, needs and abilities. It is essential to gather information about the whole child, not just isolated bits and pieces. The teacher needs the information obtainable through alternative assessment practices. She then makes instructional decisions and achievement judgments based on what she knows about each student's strengths, interests and needs. Like the project approach, alternative assessments are based on a holistic, responsive and child-sensitive curriculum.

Conclusion

Too much emphasis and confidence has been placed in traditional testing methods and not enough in alternative assessment techniques. Alternative assessments have the potential to highlight children in the process of learning and using their knowledge and skills. We need to rediscover the

possibilities of these classroom-based assessment tools and implement them in order to put our assessment practices more in tune with our classroom practices. As Wiggins states, "We need a new philosophy of assessment in this country; one that never loses sight of the student" (1989a, p. 712).

Chapter Four

Introduction to the Case Study

Description of the Case Study

Purpose of the Study

This study had a dual purpose. My first intention was to document how assessment and evaluation could be carried out in a grade three classroom by examining and implementing various assessment and evaluation tools and techniques during a project on "Building." My second intention was to establish some practical recommendations and suggestions concerning assessment and evaluation practices for teachers using the project approach in their classrooms.

Research Questions

There are three main research questions:

1. Which tools and techniques can be used to assess and evaluate student work in the project approach?
2. Which features of project work provide opportunities for student assessment and evaluation?
3. What does project work highlight concerning student achievement that wasn't highlighted through more systematic teaching methods?

Significance of the Study

To date there is little literature specifically addressing assessment and evaluation in project work. The findings of this study will provide teachers with possible assessment and evaluation tools and techniques for documenting student achievement in project work.

Methodology

The topic of this study was best suited to a qualitative research approach as it took place in the natural setting of the classroom, was descriptive, and was concerned with a process (Bogdan and Biklen, 1992). An exploratory case study design was used. M. Gall, Borg and J. Gall (1996) list four characteristics of case study research: "(1) the study of phenomena by focusing on specific instances, that is, cases; (2) an in-depth study of each case; (3) the study of a phenomenon in its natural context; and (4) the study of the emic perspective of case study participants" (p. 545). From these four characteristics, M. Gall, Borg and J. Gall offer the following definition of case study research: " the in-depth study of instances of a phenomenon in its natural context and from the perspective of the participants involved in the phenomenon" (p. 545). Merriam's (1988) comments concerning case studies lend support as she states "case study research is an ideal design for understanding and interpreting observations of educational phenomena" (p. 2). Because this study necessitated that the assessment and evaluation of students was carried out in the context of a project on 'Building" within their classroom and that the students became inherently involved in the assessment and evaluation process, a case study format provided the most favorable setting. Through the case study format I was able to study the research questions in depth and use a variety of qualitative data collection techniques.

Setting and Participants

The study took place over a three month period. The participants in the study were 28 grade three students and their teacher from a semi-rural

community in Central Alberta. The study took place within the context of a project on "Building." Classroom visits occurred four afternoons a week during the entire duration of the project.

Data Collection

Data collection methods consisted of students' work samples (students' project work, field notes, observational drawings, learning logs, self-assessment and self-evaluation data) gathered over the course of the project; anecdotal notes taken during classroom discussions, observation of students, informal conversations with students, teacher and parents; and my own reflective journal.

Data Interpretation

Data were analyzed from a qualitative perspective. All data collected were examined for evidence that related to the research questions as well as other emerging themes. Because the data collected had to do with assessing students' learning, samples were examined immediately upon collection and the conclusions drawn influenced the remaining portion of the project, as the project was adjusted, adapted and made to best suit student needs. Samples of students' work are used to highlight certain assessment and evaluation tools and techniques as well as to demonstrate student learning during the project. My interpretations of the data were discussed in various contexts and at various levels with the students, parents and classroom teacher prior to presenting them here in this study.

Role of the Researcher

I acted as a participant/observer during the course of the classroom project on Building. According to Spradley (1980), "the participant observer comes to a social situation with two purposes: (a) to engage in activities appropriate to the situation; and (b) to observe the activities, people and physical aspects of the situation" (p. 54). In collaboration with the classroom teacher, I helped plan and teach the project, develop and implement assessment and evaluation tools and techniques and assess and evaluate student work. I shared all data with the teacher and received regular feedback from her on my data interpretation.

Limitations

The findings of this study are limited to the case study of this one particular project on "building" in a grade three class and cannot be generalized to other situations.

Delimitations

The study is delimited by the deliberate selection of certain assessment and evaluation tools and techniques used throughout the Building Project and the deliberate exclusion of others.

Chapter Five

Summary of the Building Project

Introduction

Although the focus of this study is on assessment and evaluation in the Building Project, a brief summary of the project follows in order to create a setting for the assessment and evaluation tools and techniques discussed in chapter six.

The Building Project In A Grade Three classroom

Preliminary Planning

Choosing a Topic

We began our search for a topic for the project by carefully going through the Alberta curriculum and looking for areas of study that could be effectively integrated. "Building" emerged as a logical choice of topic. Under the topic of "Building," we would be able to cover two grade 3 science topics--Topic B: Building with a Variety of Materials and Topic C: Testing Materials and Designs and the grade 3 social studies topic--Topic A: My Community in the Past, Present and Future. Even though our "Building" project would be driven primarily by the grade 3 science and social studies curriculum, we knew that many other learning objectives from other areas of study would also be addressed, particularly in language arts, math and art. Not only would we cover a lot of curriculum during our project, but we would also be involved in a topic that the children had prior knowledge about and would be interested in studying, as well as having access to resources and local experts.

Collecting Ideas

Once we had decided upon the topic of our project, our next step was to begin brainstorming possible activities, guest speakers, field visits and vocabulary that could be introduced during the course of the project. A web format was used to organize all the ideas.

Involving Parents

Parental involvement is an integral part of project work. In order to take advantage of the resources and talent that exist in the wider school community, a letter was sent home to the parents introducing the project topic and asking help in collecting display materials, organizing and brainstorming possible guest speakers, field visits and activities. We included a copy of our web and also shared some of the ideas we had brainstormed. Response from the parents was enthusiastic. They were especially interested in the many hands on activities that the children could become involved in. The parents suggested names of people who could come and share their expertise, as well as possible class excursions. We were both impressed and surprised by how many people we had in the school community who had expertise on our topic and who would be willing to share their time and knowledge with us. Within our own classroom we had a roofer, a carpenter and a surveyor. We also had many parents willing to lend us building materials for our display area.

Phase One: Sharing Knowledge And Past Experiences About Building

Duration: 4 weeks

This phase of the project was devoted to finding out what the children already knew about building and how well they were able to talk about and represent their experiences. We began the project by telling the children simple stories about recent home renovations we had both done to our houses. The children then shared stories about their homes. They were anxious to talk about the size of their house, the type of house they lived in and any renovations made to their house. After sharing stories, the class brainstormed a list of possible activities that they could choose from to give them another opportunity to share and represent their experiences with building. Some of the activities selected included drawing and labeling a house or building, surveying classmates about the type of house they lived in, constructing a model of a building, writing a play about building a house, drawing and describing various tools, making a blueprint of the school, creating a question and answer game about various building features and making a poster on old-fashioned tools. Throughout phase one, the children had an opportunity to share their work and ideas with their classmates during regular sharing sessions. Toward the end of phase one, the class created their own web by brainstorming vocabulary and categorizing it under headings such as: materials, people, parts of buildings, tools, safety gear, types of buildings, famous buildings, bridges, structures, shapes, etc. We continued to add to the web throughout the project as new vocabulary and ideas were introduced. The class also compiled a list of questions they had concerning building. These questions helped to focus and direct our project during phase two.

Phase Two: New Experiences With Building

Duration: 6 weeks

Inviting guests into the class and going on field studies were integral parts of phase two. Numerous guests visited our classroom: a roofer, a carpenter, a tool safety expert, an old-fashioned tool worker, a surveyor and a bridge builder. Field study sites included a house construction site, visit to an old-fashioned village and a tour of the neighborhood. During guest visits and field studies the children took field notes of important information and observations. They also made regular entries in their learning logs to help them record and reflect on heir new experiences and learning. Another important feature of phase two was the various activities the children engaged in to help them answer their questions about building. The class brainstormed a list of activities that would help them explore these questions. Activities that the children chose included research reports on famous buildings, houses around the world, building materials in hot and cold places and old-fashioned tools, a play based on a talk show format explaining the various steps to build a house, a multi-media presentation on constructing a house, a booklet on tool safety and safety gear, observational drawings of buildings and building materials and stories and drawings about pioneer homes. Once again, throughout phase two many discussions and sharing sessions took place where the children had an opportunity to appreciate and comment on one another's work and to contribute new understandings and knowledge to the group. Children's work was displayed in the classroom, on bulletin boards and in the school display case at the entrance to the school. Various building material and books were also displayed in the classroom for the children's use.

Phase Three: Celebrating The Building Project

Duration: 2 weeks

Phase three was the culmination and celebration of the project. The children decided to have a photo slide show for their parents to highlight key features of the project. Each child chose two slides that they wanted to speak about. They wrote up their speech focusing on describing the slide and the learning that took place from the experience. The also selected work from their folders that they wanted their parents to see. The class then spent a wonderful afternoon with parents celebrating and sharing all the learning that had taken place during the project. The slide show was so impressive that the principal then asked the class to repeat it one week later for the school board. As a final culminating activity, the class designed and built bird houses with several parents. We also decided to make a class memory album of the project. We put together an album of project photos along with anecdotal stories written by the children.

Chapter Six

Assessment and Evaluation Tools and Techniques Used in the Building Project

Selection of Assessment And Evaluation Tools and Techniques

When I first began thinking of ways in which assessment and evaluation could be carried out during the building project I initially listed more than forty possible assessment and evaluation tools and techniques. It would have been inconceivable to have used all of them. Three factors influenced my selection. Firstly, I wanted a variety of assessment and evaluation tools and techniques for all three phases of the project. Secondly, the cooperating teacher, Marie, had to be willing to try the various assessment and evaluation tools and techniques with her class during the course of the building project. Thirdly, the assessment and evaluation tools and techniques needed to uphold my current convictions concerning student assessment and evaluation. These beliefs evolved as a result of my classroom experience, collaboration and discussion with colleagues and my recent reading and reflecting on effective assessment and evaluation practices:

*Assessment and evaluation primarily serve student and teacher
*Assessment and evaluation need to influence instruction
*Criteria for assessment and evaluation must be established before assessment and evaluation take place
*Criteria for assessment and evaluation must be shared with students before assessment and evaluation take place
*Students and parents should be involved in the assessment and evaluation practices
*Assessment and evaluation should be as unobtrusive as possible
*Assessment and evaluation should be ongoing
*Assessment and evaluation tasks should be authentic, regular activities of the classroom
*Assessment and evaluation practices need to be varied and multiple

Building Project Assessment and Evaluation Tools and Techniques

Nine assessment and evaluation tools and techniques were eventually selected for the Building Project study:

* Learning Logs
* Field Notes
* Quality Work Chart
* Project Work Planning Chart
* Self-Assessment and Evaluation Criteria for Phase Two Activities
* Peer Evaluation
* Project Study Sheet
* Portfolio and Project Self-Evaluation Sheet
* Anecdotal Notes

The remainder of this chapter describes in detail each of the assessment and evaluation tools and techniques listed above. Each entry includes:

1.) Description of the tool or technique
2.) Purposes of the tool or technique
3.) An account of classroom practice during the Building Project with the tool or technique
4.) Assessment and evaluation opportunities concerning the tool or technique
5.) Strengths and Challenges of the assessment and evaluation tool or technique

Not unexpectedly, each tool and/or technique proved to have both strengths and limitations. Although they varied in their ability to highlight children's learning, all of them provided useful and insightful assessment and evaluation data. It is important to remember that the following summary of

the assessment and evaluation tools and techniques used in the Building Project applies only to the tools and techniques in the way they were used in this particular project. Used in a different context, each tool and/or technique could conceivably be described differently and serve different purposes. In addition, each tool and technique could be used differently in the classroom, offer different opportunities for assessment and evaluation, as well as display different strengths and limitations.

Samples of the assessment and evaluation tools and techniques and samples of children's work are also included where applicable.

Learning Logs

Learning Logs

Description

Throughout all three phases of the Building Project the children wrote in learning logs. The learning logs served as one of the primary assessment and evaluation tools throughout the project. The entries were an informal, first-draft collection of writing recording the children's thoughts, reactions, reflections, learning and questions concerning the Building Project. The children made entries in their learning logs preceding and following an activity, a field visit, a guest visitor or a class discussion. Keystone scribblers (8 1/2" x 11") cut in half served as the log books.

Purpose

*to give the children an opportunity to record their thoughts about, reactions to, reflections on and questions pertaining to the Building Project
*to provide the children a written record of their learning that occurred during the course of the Building Project
*to enable the children to look back at their entries and self-evaluate their learning and experience of the Building Project
*to provide insights for the teachers into students' understandings, misconceptions, interests and questions regarding the Building Project
*to provide topics for classroom discussions

Classroom Practice

Phase One:

During Phase One, Marie and I were interested in discovering what experiences and knowledge the children already had concerning the topic

"Building." We were also interested in knowing how well they could describe their experiences and share their knowledge in a written format. We wondered what vocabulary would show up in their writing, what misconceptions they held about building, what questions they would ask and what interested them about the topic of Building. During Phase One, the children made three separate entries into their learning logs. All log entries centered around sharing knowledge and previous experiences with building. In order to stimulate the children's interest in writing and help the children put their thinking into words, a class discussion preceded each learning log entry. During the class discussions the children had an opportunity to share orally what they already knew about building. They were encouraged to use as much "building" vocabulary as possible when describing their building knowledge or relating their building experiences. Questions and comments from their classmates and Marie and myself challenged them to add more details to their stories. Following the class discussions, the children were asked to write in their learning logs. Several questions or prompts were used to help focus their writing and to further stimulate thought. The children were asked to think about the questions and prompts before they began their entry. The following list of questions and prompts was used for the Phase One learning log entries:

*Have you every built anything or helped someone build something? If so, explain how you built it.
*Do you know anyone who builds things? Describe what they do.
*Name and describe as many building tools as you can.
*Name and describe different types of people involved in the building industry?
*Name as many different types of buildings and structures as you can.
*Draw a building or structure and label all the parts.
*Why don't tall buildings fall over?

When the children finished their entries, the learning logs were handed in and read by Marie and myself. The children received feedback on all their entries. Marie and I responded to their entries by writing back to the children in the learning logs. Our responses took the form of comments, questions or requests for clarification and additional detail. The learning logs were then handed back to the children and they were asked to read over their entry and our replies and respond once again. In order to establish a baseline of the children's collective knowledge and experience on the topic "Building," we felt it was necessary to give them several opportunities to write in their learning logs and respond to our feedback. We wanted the children to share and show as much as they could about the topic before we began Phase Two, which introduced the children to new learning and experiences.

Phase Two:

Phase Two entries comprised the bulk of the learning log writing. During this phase, Marie and I were most interested in assessing the children's learning and reactions to new experiences with "Building." During Phase Two, the children had numerous opportunities to visit field sites, gain expertise from guest visitors and engage in class and individual activities. Each visit to a field site, classroom visit from a guest, engagement in class discussion and group and individual activities involved at least two separate entries in the learning logs. The first entry preceded the field site visit, guest visitor or class activity and the second entry followed the event. This entry helped establish a baseline of the children's understanding of the topic before being presented with new information. We wanted to assess where the children were starting from at the beginning of Phase Two so that we could

assess how much they learned at the end of that phase. For the first entry, the children were asked to reflect on the topic being presented and write down their prior experiences and knowledge concerning this topic in their learning log. Similar to Phase One, before each entry, the children were given questions to reflect on in an attempt to help them shape their thinking. For example, before a bridge builder visited the class, the children were asked to write in their logs about bridges. Marie and I asked them to tell us all that they could about bridges. We told them to use as much "bridge" vocabulary as possible in their entries. In order to best help them share their ideas, we gave them the following questions as possible points of departure:

*Draw a bridge and label its different parts.
*Draw different types of bridges and describe them.
*What materials are used to build bridges?
*How are bridges built over a river?
*What makes bridges strong?

We emphasized with the children that these questions were simply prompts and that they did not have to answer each question but rather use them to provoke their thinking about bridges. When the children finished writing in their logs we often asked several of them to share their entries. Spontaneous class discussions often resulted. Questions that the children had for the guest that arose from the sharing sessions were written down in anticipation of the visit. Marie and I collected the logs after each entry and read them. We wrote back to each student commenting on their entry and asking questions seeking further clarification or additional information. The logs were then handed back to the children and the children were asked to read their entry and respond to our comments and questions. The children

continued to make entries in their learning logs until Marie and I felt they had exhausted their knowledge base. The children then participated in the field visit, interacted with a guest visitor, or engaged in group or individual activities aimed at introducing them to new concepts and ideas about "Building." When the activity was over, the class spent time discussing the event. The children were then asked to reflect back on the event and record their learning, reactions, questions and comments in their learning log. Once again, questions and prompts were offered to the children to help provoke further thought:

*As a result of this field visit, guest visit or activity, what new things did you learn about the topic being presented?
*What did you learn today that you didn't know previously?
*How can you use the information that was presented to you today?
*Do you still have any unanswered questions about the topic being presented?
*What didn't you understand about the topic being presented?
*What surprised you about today's presentation?
*What disappointed you about today's presentation?

Once again, after the children wrote in their logs, the logs were collected and responded to by Marie and myself. As with all other entries, Marie and I made comments, posed questions and asked for further clarification and details. Our responding to the children's entries was an attempt to elicit from them as much information as possible about their learning so we could assess to what extent they had mastered the learning objectives of the lesson. The assessment data obtained from the learning logs helped Marie and I decide what concepts were best understood, which concepts needed further elaboration, which concepts were lacking, as well as which children in particular needed additional help in understanding and mastering the concepts presented. Learning log entries greatly influenced instruction.

Phase Three:

During Phase Three, Marie and I used the learning logs as a way to assess holistically the children's ability to share the experiences they had had during the Building Project. The children only made one entry in their learning log in Phase Three.

Opportunities for Assessment and Evaluation

The entries in the learning logs served as both formative and summative assessment data throughout the project. The learning logs gave Marie and myself an opportunity to continuously assess the class as a whole and each individual child's learning, reflection, misconceptions, and interest in the various aspects of the Building Project. We were thus able to steer the Building Project in a direction that most suited the needs of the children. We used the formative assessment information from the entries in several ways.

Firstly, the direction of the building project was in part determined by the children's prior knowledge and experience with Building, This prior knowledge and experience was assessed through the learning log entries. We didn't want to repeat activities that the children had already experienced, or introduce concepts and ideas that they already understood well. Learning log entries provided important insights as to potential field visits, guest visitors and class activities that would expand upon the children's prior knowledge and experiences.

Secondly, misconceptions that the children held about "Building" appeared in their log entries. These misconceptions were then addressed through class discussions, presentations, activities and teacher-directed lessons aimed at pointing out and correcting the misconceptions.

And thirdly, learning log entries help shed light on the children's ability to explain new concepts and ideas, articulate and assimilate new learning, share insights and use new vocabulary appropriately. Based on the children's entries, further discussions took place, follow-up activities were introduced and supplemental explanations and demonstrations were given.

At the end of the project, Marie and I evaluated the learning logs. The logs entries were evaluated summatively using a rubric developed with the class. The rubric established important criteria for learning log entries. The criteria were frequently discussed with the class and referred to throughout the duration of the project. The rubric gave us a very quick and efficient way to evaluate the learning logs.

Strengths And Challenges of Learning Logs and Learning Log Rubric

Strengths:

Learning Logs

*provide plenty of data for teacher to assess both class and individual children's understanding, misconceptions, learning and reactions to specific events in the project

*provide an opportunity for the teacher to have a one-on-one conversation with each child to assess his/her learning experiences. By responding to children's log entries, I can help focus my students reflections on their learning and thereby gain greater insights into themselves as learners.

*provide a written record of the student's learning experiences during the project

*enable students to reread their entries from beginning of project and compare them with entries toward the end of project, thus encouraging self-assessment of their learning

*an alternative to tests. Rather than develop and give a test of what I

would like my students to know, I can simply ask, "What have you learned? Show me by writing about it in your learning log." Students then have the opportunity to tell me what they feel is most important and relevant about their learning experiences. All students have something to share.

Rubric

*establishes various levels of achievement.
*students help define and describe the various levels of achievement
*students are aware of the summative evaluation criteria before beginning writing in their learning logs
*provides an efficient and quick way to make a summative evaluation of learning logs

Challenges:

Learning Logs

*time-consuming for both children and teacher. It takes a lot of time and practice to develop reflective skills. Children need regular opportunities to write in their logs and respond to teacher's comments and questions. Teachers also need a considerable amount of time to read and respond to every child's entries.
*children need a lot of direction, preparation and modeling in order that their learning log entries focus on describing their learning rather than describing the activity that contributed to their learning
*children's ability to articulate their learning, thoughts, etc. is linked to some degree to their level of writing skills, their ability to reflect on themselves as learners and their ability to articulate their learning

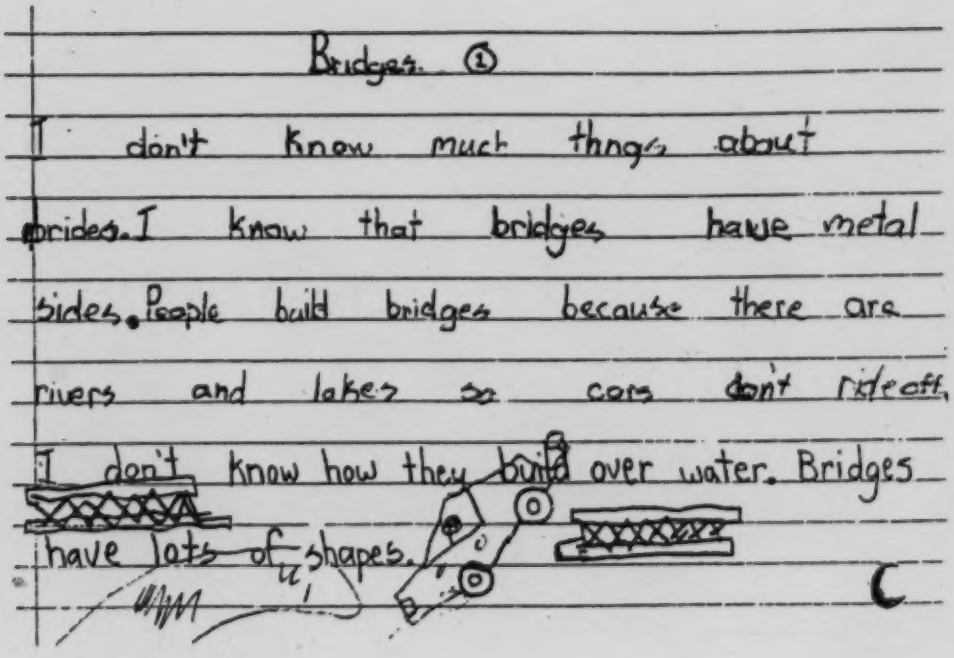
Rubric

*difficult to describe the differences in the various levels of achievement in a manner that the children will understand
*time-consuming to design with the children. It's necessary for the teacher to have brainstormed in advance what the rubric might look like in order to guide the construction of the rubric with the children.

Samples of Learning Log Entries

The children were asked to write in their learning logs before and after most guest visits, presentations or class discussions. The following learning log entries exemplify typical before and after writings. Comparing the two entries gave us the opportunity to assess the children's ability to articulate their learning in writing. As expected, entries done prior to a guest visit, presentation or class discussion tended to be vague and lacking in detail and information. Entries done after a guest visit, presentation or class discussion showed evidence of learning of new vocabulary, information and concepts. The learning log rubric was used to assess and evaluate the sum of the entries made during the entire project.

When asked to write about bridges in his learning log, William made the following entry.



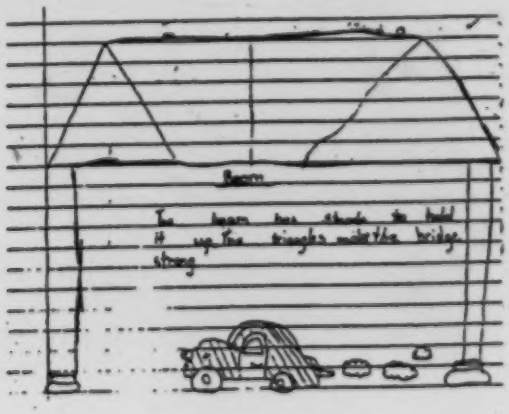
Bridges ①

I don't know much thngs about brides. I know that bridges have metal sides. People build bridges because there are rivers and lakes so cars don't ride off. I don't know how they build over water. Bridges have lots of shapes.

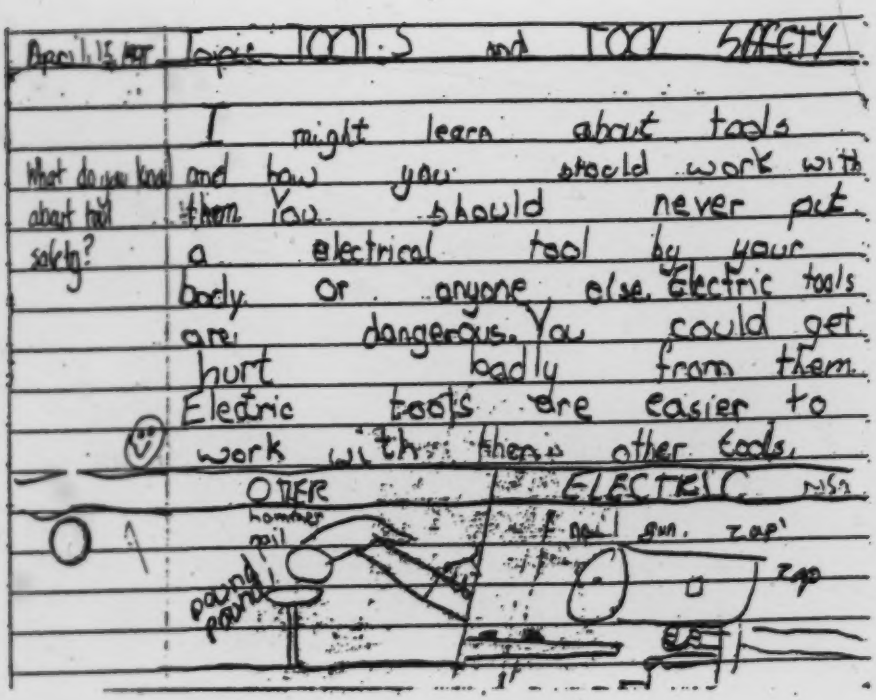
After having attended a presentation on bridges and participated in several hands-on activities, William wrote this entry in his learning log.

Bridges ②

Bridges are made of Concerte, Steel, logs, and wood. There are many kinds of bridges like Beams, Cantileuer, Arch, and Suspensan. A long time ago they used Wood and logs. The bogest bridge is in Qebec I think. Bridges have triangles, diangles, and squares in it. These shapes are strong but the triangle is strongest. Long posts go into the river to suport the bridge.



When asked to write about tools and tool safety, Milan made the following entry in her learning log.


April 15, 1997
Topic TOOLS and TOOL SAFETY
What do you know about tool safety?
I might learn about tools and how you should work with them. You should never put a electrical tool by your body or anyone else. Electric tools are dangerous. You could get hurt badly from them. Electric tools are easier to work with then other tools.
OTHER
hammer nail
pound pound
ELECTRIC
nail gun. zap!
zap

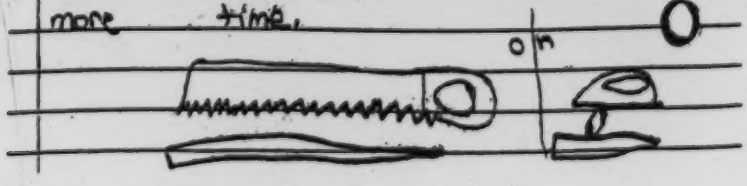
After the presentation of a guest visitor to our classroom who talked about tools and tool safety, Milan made the following entry in her learning log.

April 16, 1997 Tools And Tool Safety

I learned that if someone is hurt you have to make them comfortable and call 911. Loose clothing is dangerous at a building site. Your clothes could get caught on a tool and hurt or cut you. When you are building you have to wear special steel toe and sole boots so your toes or feet don't get damaged. You also need gloves so you don't cut yourself. At a building site you also need ear muffs or earplugs to protect your hearing.

You will also need a dust mask for mouth protection and a hard hats for head protection. You also need goggles to keep out dust.

There are lots of different kinds of tools. There are electric tools and hand tools. In the olden days they used to use the hand saw but now they use the electric saw. It saves alot of work to use with a nail gun and a hammer. A hammer takes much more time.



Learning Log Rubric

Learning Log Rubric

Criteria	Excellent	Good	Fair	Limited	Comments
INFORMATIVE New vocabulary, ideas and concepts present in entries.	New vocabulary, ideas and concepts <u>always</u> present in entries.	New vocabulary, ideas and concepts <u>Frequently</u> present in entries.	New vocabulary, ideas and concepts <u>occasionally</u> present in entries.	New vocabulary, ideas and concepts <u>rarely</u> present in entries.	
REFLECTIVE Personal connection shown by asking questions or making comments about the topic.	Evidence of very close listening and observing. Insightful comments made and/or thoughtful questions asked that are definitely connected to important issues.	Evidence of careful listening and observing. Comments made and/or questions asked are connected to important issues.	Evidence of listening and observing. Comments made and/or questions asked are not really connected to important issues.	Little evidence of listening and observing. Comments and/or questions are unclear, confusing and not connected to the topic.	
COMPLETENESS & EFFORT Entries are complete and detailed.	All entries are present. They are lengthy (2 pages) and very detailed.	All entries are present. They are fairly lengthy (1½ pages) and detailed.	All entries are mainly complete. They are brief (1 page) with few details.	Entries are incomplete and/or missing. They are very brief (less than 1 page) with little or no detail.	

Field Notes

Field Notes

Description

Field notes were an integral part of our "Building Project." During Phase Two, the children had many opportunities to visit topic-related sites and interact with guest visitors who came to share their expertise and experiences concerning "building," During each field visit or guest visitor's presentation, the children were expected to take field notes: detailed notes recording the experience. Their notes included labeled drawings of objects displayed, brief notes highlighting important information and personal observations and insights. These notes were a valuable source of information and provided inspiration for further activities and learning. The children used blank pieces of white paper attached to a clip board for their field notes. During a class discussion on field notes, the class came up with a chart describing the qualities of good field notes. The class subsequently used this chart to assess the quality of their field notes throughout the project.

Purposes

*to record information obtained from field visits and guest presentations
*to provide a source of information for follow-up activities
*to keep children accountable for their learning by requiring them to record information
*to provide children an opportunity to self-assess their ability to record and use data gathered from a variety of sources
*to provide teachers an opportunity to assess children's ability to record and use data gathered from a variety of sources

Classroom Practice

Before each field visit or guest presentation much preparation was needed in order to get the children ready to take field notes. Firstly, the children had to organize their clipboards. They needed to attach paper, sharpen pencils, record the date, their name and the name of the field site being visited or the topic being presented. Secondly, a class discussion was held pertaining to the forthcoming visit or presentation. The discussion focused on what we could expect to see, observe and do. We discussed in detail what the field visit or presentation would probably involve. We also charted a list of possible questions to ask. Each child was responsible for writing down and obtaining the answer to at least one question during the visit or presentation. Thirdly, we reviewed techniques for taking notes. We discussed how to write notes in point form, how to organize notes and the importance of drawings. We also discussed the need for the children to write quickly and to record only the most relevant information. Upon return from the field site or completion of the presentation, the class gathered together to discuss the experience. The field notes were used as an important source of information during the class discussion. The children used their notes to confirm, compare and revise information collected. Part of the class discussion also centered around the quality of field notes. The class referred to the chart listing the expectations concerning field notes in order to self-assess their success at note taking. Exemplary samples of children's field notes were often used to highlight successful note taking techniques. The class also agreed upon a list of essential information gained from the field visit or presentation that needed to be included in the notes. After the class discussion, the children were then given time to add additional details and information to their notes.

Opportunities for Assessment and Evaluation

The assessment chart for field notes resulted out of concern over the quality of the children's field notes. Despite numerous class discussions and demonstrations on field notes, the children's first field notes were very disorganized, messy, lacked essential data and attempted to record word-for-word what the speaker said. Their note taking skills were very ineffective. Marie and I both strongly felt that they needed more structure and guidelines in order to help them capture and record purposeful field notes. Because note taking is such an important part of project work, Marie and I felt that a chart outlining qualities essential to good field notes was needed. The children played an integral role in developing the criteria for the chart. The class gathered together and looked at samples of exemplary field notes. We talked about the qualities that made these field notes good. We then listed these qualities and this list became our assessment tool for all field notes taken during the remainder of the project. The chart was very helpful in helping the children determine to what extent they had succeeded in taking useful field notes and what elements were weak or lacking from their notes. The chart also gave Marie and me a quick and efficient way to assess the children's field work. We used the criteria to dialogue with the children about the quality of their field notes and to determine what needed to be done in order to improve the quality.

Strengths and Challenges of Field Notes and Field Notes Checklist

Strengths:

Field Notes

*provide a record of what interested children during a presentation, demonstration, lesson, activity, guest visit, field study, etc. Teacher can then adjust project to address children's interests.

*information collected provides a starting point for discussing children's learning, misunderstanding, missing information, etc. Teacher can use information from children's field notes for follow-up activities, class discussions, demonstrations, etc. designed to provide missing information or correct misunderstandings.

*help keep children accountable for their learning by requiring them to record information gained from presentations, demonstrations, lessons, activities, guest visits and field studies.

Field Notes Checklist

*lists features for teacher to look for when assessing children's field notes

*provides points for discussion when commenting on children's field notes. Teacher can refer child to checklist to show what was done well or what needs improvement concerning child's field notes

*children have criteria to self-assess the quality of their field notes. Children can use checklist to ensure that they have included all items and that all items have been completed in a competent and thorough manner

Challenges:

Field Notes

*note taking is a developmental skill requiring much practice. Children's ability to take effective notes is limited by their ability to discern what is important to record and their willingness to record that information

*teacher cannot assume that the child understands all that he or she has written down for notes. Class discussion was necessary to assess depth of children's understanding. Often children just copied down new vocabulary, or jotted down key words concerning a concept, idea or information introduced without really understanding what it meant. Class discussions

were necessary as a follow-up activity in order to clarify misunderstandings, fill in missing information and evoke reflection.

Field Notes Checklist

*certain features of field notes not noted on the checklist could possibly be overlooked

*children may adhere too strictly to criteria outlined in the checklist and not take advantage of their own creativity, insights when taking field notes

Samples of Children's Field Notes

Guest: Peter Caron

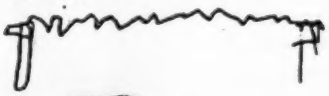
Topic: old Fashioned Tools ↓ PS. and houses

cow, menore

Questions: What was the First tool invented

First tool made of stone

Notes:



brick called Adobe →

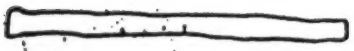
used to paint the bricks with milk

Some houses were made of sod

Felling Axe

house made of sod

Tree nails



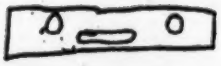
auger

boro

Thing For roofs

- wood
- shingels
- burch bark
- hay

level



travaler

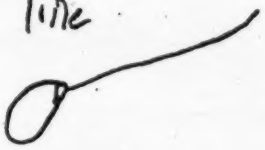
plumb bob

you can make alot of things whith burch bark

Scythe

Frog

Chalk line



like a a clob

maul

Guest: Dwight from "Dwights Roofing"
Date: May 8th 1997

Q: How many kinds of shigles ap there?

A: 20 diffrent types of Shingles and colors

Notes & Drawings

- flat roofing he doesn't do - mostly 3-4 days to build
- he does sloaped roofing - work all year around
- he brought lots of samples - takes 3 year for flat roofing
- Fine I get to Keep - decornet doesn't wear out
- and a nail and a small nail - 20 years before replace roof
- and an ashfall shigle - 4 shingled lots
- Knee pad, foot pads they - ceder smells good
- prevent you from falling - corkers on shoes so you won't slip
- weors harness - Aine shakes cheaper then ceder
- uses a hatchet the - look like soccer cleats (shoes)
- most has a meseauring thing
- special knif call hook knife
- cuts from bottom
- 8 3/12 is shallow
- 12/12 steep roof is
- hard to walk on
- we harness for 4/12
- ashfal shigal covers 6 inches per row
- need shigles to protects outside weather
- made with gravel from tar and paper
- pine shacke come from Wash
- ashfal least expensive
- most common used
- roof lasts 20 years
- lots people fall off
- most dangerous job in

Field Notes Assessment Chart

FIELDNOTES

Fieldnotes are used to help us remember important information.

	Comments
1. Jot down notes. You do not need complete sentences.	
2. Listen carefully. Jot down important information that you hear.	
3. Observe carefully. Jot down important information that you see.	
4. Keep notes organized. - point form - keywords - boxes - diagrams - drawings - neat printing	
5. Label drawings and diagrams.	
6. Include description of the activity, date and your name on your fieldnotes.	

Quality Work Chart

Quality Work Chart

Description

The Quality Work Chart contained five descriptive sentences outlining various characteristics which needed to be present and various procedures which needed to be carried out in order that a piece of project work be considered "quality work." The chart was made from lined chart paper and hung in a highly visible location in the classroom throughout the duration of the project so that the children could easily refer to it to self-assess and evaluate the quality of their project work before handing it in for a final evaluation.

Purposes

*to help children self-assess and evaluate the quality of their project work
*to help the teacher assess and evaluate the quality of the children's project work

Classroom Practice

In order to establish expectations for "quality work" the class sat down together and talked about quality work: the need for quality work, what quality work looks like and what procedures to follow to achieve quality work. The ideas were when summarized in sentence form and listed on a chart. In order to determine to what extent a particular criterion had been met, the class decided that each criterion should be rated from one to five. One being the lowest score and five the highest. The class discussed in detail how to rate a piece of work. We looked at samples of work and determined together what score it merited for each particular criterion. Throughout

the entire project, the children were asked to self-assess and evaluate their individual project work using the Quality Work Chart before handing it in for a final evaluation from Marie and myself. Every self-assessment or evaluation session was preceded by a discussion reiterating the criteria and reviewing the procedure for scoring a piece of work. Once children had assessed and or evaluated their work, they were given time and encouragement to improve those areas which received low scores.

Opportunities for Assessment and Evaluation

In project work it is important that the children realize there is an audience for their work. The work has a purpose. Children are expected to share their work in order that the whole class may benefit from the skills and expertise that each child acquired while engaged in their individual project work. Insisting that children produce "quality work" is not enough. The children need to know what quality work looks like and what they have to do to achieve it. When children meet and exceed the expectations they feel proud of their work. When they understand and accept the expectations, they can then be held accountable for their work.

Strengths and Challenges of Quality Work Chart

Strengths:

*children knew at the beginning of the project the expectations concerning the quality of their project work. Children could then be held accountable for the quality of their work because they played a crucial role in describing and defining quality work

*children had clear descriptors describing what quality work looked like and what they had to do to achieve it

*children had the information necessary throughout the project to

self-assess and evaluate the quality of their project work before handing it in for final assessment and evaluation

Challenges:

*self-assessment is a developmental process. Not all children are ready or willing to objectively assess their work. Some of the children tended to be either too strict or too generous when assessing and or evaluating their work.

*children needed a lot of guidance, practice and modeling before being able to self-assess and evaluate their work. Many class discussions, reviewing and one-on-one explanations were necessary in order for the children to make effective use of the Quality Work Chart independently.

Quality Work Chart

Quality Work - What Does It Look Like?

Name_____

Date_____

Activity_____

1. My work is neat and organized so that someone else could understand and learn from it.

   1 2 3 4 5

2. I've included important information like titles, explanations, labels, date, my name, etc.

   1 2 3 4 5

3. I've shared my work with someone and received feedback.

   1 2 3 4 5

4. After having received feedback, I looked over my work and improved it. (Corrected spelling, Added information and detail, Expanded on ideas)

   1 2 3 4 5

5. I'm proud of my work because I put good effort into it. I've shared my learning as best as I could.

   1 2 3 4 5

Comments:

Project Work Planning Sheet

Project Work Planning Sheet

Description

In order to guide the children in the planning of their phase one and phase two activity, Marie and I prepared a planning sheet. The sheet required the children to think about eight different aspects of their proposed project and write down their responses. Before beginning their activity, the children had to have their plan approved by either Marie or myself.

Purposes

*to give the children guidelines and direction for planning their activity
*to help the children foresee any problems, difficulties with their proposed activity
*to help the children clearly articulate the learning objectives of a proposed activity
*to help the teachers determine the worthiness of a proposed activity
*to help the teachers determine the children's intention for a proposed activity
*to give the teachers an opportunity to sit with each child and go over his or her plans for an activity
*to hold the children accountable to a proposed plan for an activity
*to establish a sense of seriousness and thoughtfulness about the children's project work
*to help teachers plan for needed materials, resources and instruction

Classroom Practice

After having selected a Phase One or Phase Two activity from the chart, each child was required to fill out a "Plan For My Phase One/Two Activity" sheet. To introduce the sheets, Marie chose an activity and used an overhead transparency of the planning sheet in order to effectively model

how to plan out a proposed activity. With the class' help, Marie went through each item carefully on the planning sheet noting for the children the important things to consider. Once planning had been modeled for them, Marie handed out the sheets and the children began planning for their proposed activity. As the children worked, Marie and I walked around and assisted the children when needed. Each child was required to have their plan approved by either Marie or myself before beginning their activity. When a child approached us to look over his or her plan, Marie and I meticulously examined each section to ensure that it had been carefully thought about. If a child's responses were unclear or ambiguous, Marie and I itemized for that child exactly what information was missing. The child was then responsible to supply requested information and resubmit his or her plan. Once a plan was approved, the child could begin work on his or her activity immediately. On average, the children took two sessions to complete their plans. Some children needed a lot of one-on-one help to carefully think through their plan and articulate the shape and direction of their activity.

Opportunities for Assessment and Evaluation

Once the planning sheet was completed and approved, Marie and I had a very good idea of the intention of each child concerning his or her proposed activity. We had met with each child and used the planning sheet to discuss the activity in detail. The planning sheet gave us a structure for our discussions. A child's ability to plan an activity was easily assessed by the manner in which the planning sheet had been filled out and the ensuing one-on-one discussion. Once Marie and I had assessed the degree to which the child had successfully planned his or her activity, we were then able to give

him or her specific feedback concerning additional planning necessary before the activity could be approved and begun.

Strengths and Challenges of Project Work Planning Sheet

Strengths:

*each child was obliged to think through their activity and articulate a plan for it before rushing into it

*the teachers were able to have a clear understanding of each child's proposed activity

*the planning sheet provided a format for discussing various aspects of the proposed activities

Challenges:

*time-consuming. In order for each child's plan to be approved, it was necessary to meet one-on-one with each child and to meticulously go through each item on the planning sheet

*some children experienced great difficulty planning out an activity. It was necessary to sit down one-on-one and help them not only formulate their plan but also articulate it as well

Project Planning Sheet

Plan For My Project Work

Name: _____

Date: _____

Research Topic: _____

1. **Describe your project**: (What type of activity are you planning to do? Have you ever done an activity like this before? Why did you choose this activity? What are you going to learn and share with others from doing this activity?)

_____

_____

_____

_____

_____

2. **Materials needed**: (What materials do you need for your activity? Are the materials available in the classroom or school or will you have to spend time collecting them yourself?)

_____

_____

_____

3. **Time:** (How long will it take you to complete your activity? Remember! You will begin by collecting information, taking notes and then making a rough copy; once you've done all this then you can begin planning your presentation.)

_____

4. Support for your Activity: (What type of help might you need from others? Will you need help from your teacher, friends, parents, etc.? What will you ask them to help you with? What will you do if you have problems while working on your activity?)

_____

5. Preparation: (What do you have to do before you start your project? Do you need to draw? brainstorm? web? discuss? collect resources, books, etc.?)

_____

_____

_____

6. Sharing Your Project: (When your activity is finished, how will you share it with others? Class Presentation? Demonstration? Bulletin Board Display? Written Report? Video, Computer or Overhead Presentation? Other?)

_____

_____

_____

7. Feedback: (Share your plans with your teacher. The two of you will talk about your project and decide if you're ready to begin. You and your teacher will also establish the criteria you will have to follow for your project.)

_____

_____

_____

_____

8. Ready to Begin: (Both you and your teacher have to sign your plan.)

_____

(student's signature)

_____

(teacher's signature)

_____

(date you started your activity)

Self-Assessment and Evaluation Criteria for Phase Two Activities

Self-Assessment and Evaluation Criteria for Phase Two Activities

Description

Criteria specific to each Phase Two activity were developed and used by the children to self-assess and evaluate their work. Marie and I also used the same criteria to assess and evaluate the children's work. The criteria established precise guidelines for the children concerning content, presentation and format for the activity. The children were intimately involved in establishing the criteria before beginning the activity. For evaluative purposes, the class decided that each category of criteria would be rated from one to five. One being lowest and five being highest. The criteria for each activity were written up on chart paper and displayed throughout the classroom.

Purposes

*to establish minimum expectations concerning the content, presentation and format of each Phase Two activity
*to communicate the expectations to the students concerning the Phase Two activities
*to establish criteria for the children to self-assess and evaluate their Phase Two activities
*to establish criteria for the teachers to assess and evaluate the children's Phase Two activities

Classroom Practice

During Phase Two of the "Building Project," the class brainstormed more than twenty activities designed to help them extend and expand their knowledge and experience about "building." From this list, each child had the

responsibility to choose an activity best suited to his or her interests and needs. Once the children had each selected their activity, the children were grouped together based on their choice of activity. All children who chose to write reports were put in one group. All children wanting to make a comic strip about pioneer houses were placed in another group. All children interested in producing a play about building a house were grouped together, and so on until each child was grouped with children working on a similar activity. All groups met separately with either Marie or myself to discuss planning their activities. During the meeting we also brainstormed the criteria by which the activity would be assessed and evaluated; therefore, the children were aware from the onset the criteria by which they could assess and evaluate their work and by which their teachers would assess and evaluate it. We discussed in depth the meaning of each criterion and what was involved in meeting the expectations established. The criteria were purposely written using language familiar to the children because the criteria were ultimately to serve the children in both structuring their activity and producing exemplary work. If a child's activity was unique, that child worked independently with a teacher to establish appropriate expectations and criteria for her or his activity.

Opportunities for Self-Assessment and Evaluation

As the children worked on their activity throughout Phase Two, they were continually referred to their activity's chart in order to self-assess their work. The charts were very valuable to Marie and I as constant reminders of what each child's activity should look like. Because so many different activities were being carried out simultaneously, the charts were a

very effective way to organize and understand what each activity entailed. Marie and I were able to make suggestions, critique and coach after a quick glance at the charts. When the children, Marie and I were all convinced that an activity had been completed, each child was then asked to evaluate their work using the criteria from the chart. Photocopies of the criteria were handed out and the children filled them out. Marie and I also followed the same procedure for the final evaluation of the children's Phase Two activity.

Strengths and Challenges of Self-Assessment and Evaluation Criteria for Phase Two Activities

Strengths:

*a quick, effective way for teacher to both assess and evaluate children's Phase Two activities because criteria for assessment and evaluation were established at the beginning of the activity and could be readily referred to during and at the end of the activity
*criteria were established with the children, therefore children knew and understood expectations concerning their work before beginning activity
*criteria were clear, specific and relevant because they were developed for and pertained to each separate activity.
*children could self-assess and evaluate their work using criteria set out for their specific activity.
*able to share evaluation criteria with parents thus allowing them the opportunity to work with their children on the activity
*children enjoyed a lot more freedom while working on their activities because they had expectations for their work set out for them and were free to work as long as they were fulfilling these established expectations

Challenges:

*time consuming to meet separately with each group and develop criteria appropriate for each activity

*despite having specific criteria set out for them, some children still needed a considerable amount of help to self-assess and evaluate their work

Criteria for Phase Two Activities Along with Samples of Children's Work

Name:_____

Thinking About My Work

Activity: Booklet On Safety When Working With Tools

1. Research Should Answer The Following Questions 1 2 3 4 5
   -What is the name of the safety equipment?
   -How does the safety equipment protect the worker?

   Comments:

2. Report 1 2 3 4 5
   -Reader learned something new about safety from reading the booklet
   -Student used own words
   -A lot of information and detail is included
   -Writing keeps reader's interest
   -Writing is organized and easy to understand by reader

   Comments:

3. Presentation 1 2 3 4 5
   -Presentation is neat, organized and attractive
   -Drawings/Pictures are included
   -Details and colors in drawing are accurate

   Comments:

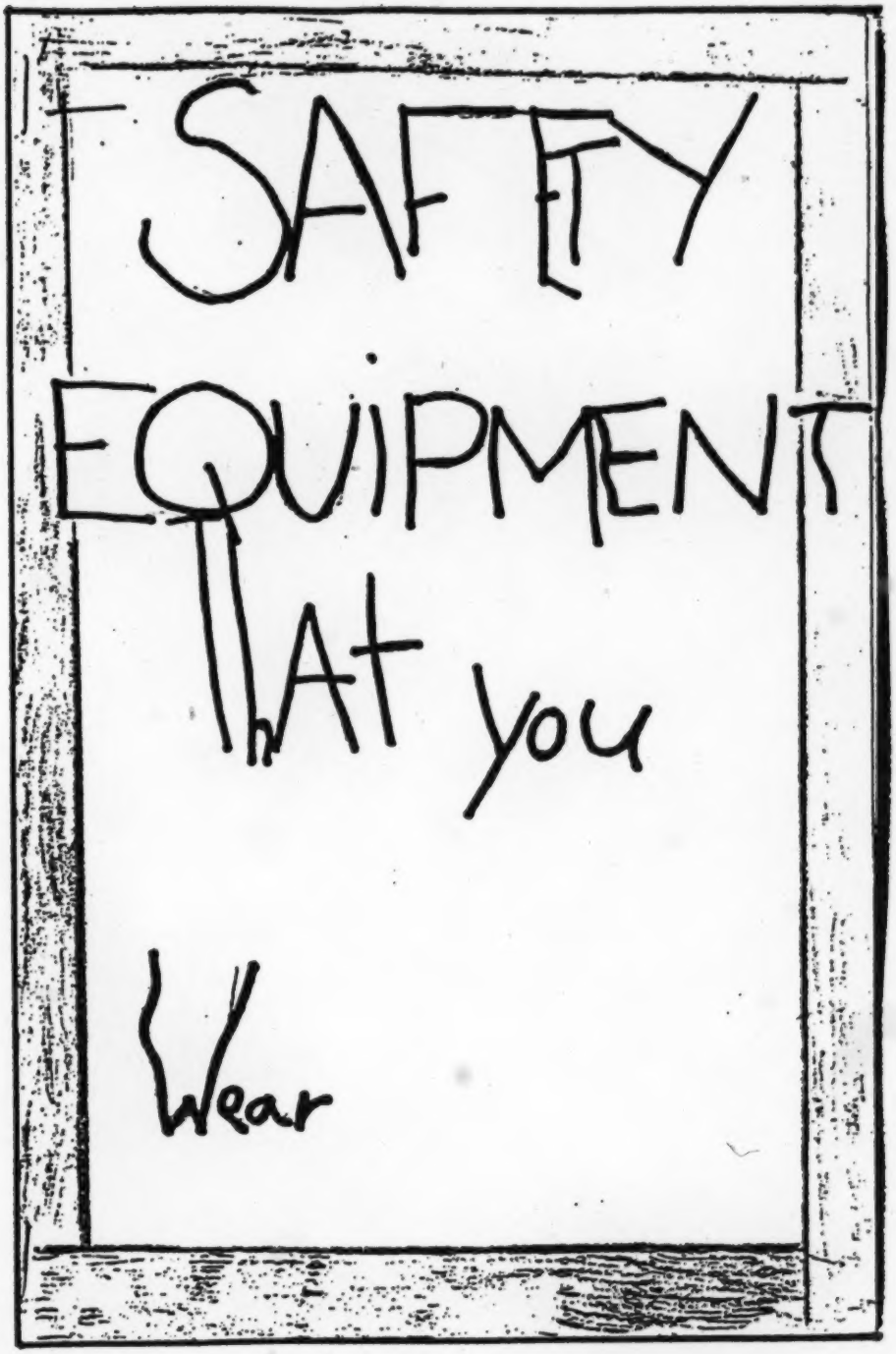
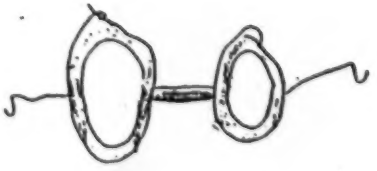

SAFETY
EQUIPMENT
That you
Wear

Table of contents

Safey Glasses.... 1
Hard hat... 2
Ears Muffs... 3
Leathers Gloves.... 4
Steels Toe Boots... 5
Dust Musk... 6
Body Clothing... 7

Safty Glasses

Safty glusses protect your eyes from sharp peices of wood and from dust. Make sure that your glasses fit right.



Hard Hats

Hard hats protects your head from getting hurt. If a hard object falls down on your head you could split your head open.

8

2.

Ear Muffs

Ear muffs protects your ears. If you don't wear it then you maybe become deaf or hard of hearing.

① Make sure the earmuffs fits right.

② Make sure your earmuffs are in good shape.

③ Make sure you wear it all time when you are working.

④ Make sure you also go ask the doctor for hearing tests.

We use earplugs to protect yourear from noise. Earplugs fit right inside in your ear and Earmuffs fix right outside your ears.

3.

Leathers Gloves.

Leathers gloves proects your hands from getting cut from slivers. Some wood and steel can be rough and hurt hands.

4.

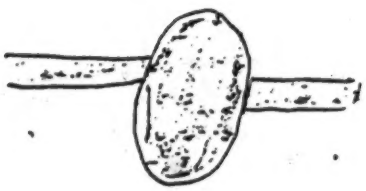
Steel Toe Boots

Steel toe boots protect your feet from the heavy objects falling On your feets. If it fall on your feet and you don't have steel toe boots your toes will be broken.

5.

Dust Musk

You were a dust musk to cover your mouth and nose so you don't breathe in dust. If you don't use it, the dust will go in your lungs. The dust musk protects your lungs.



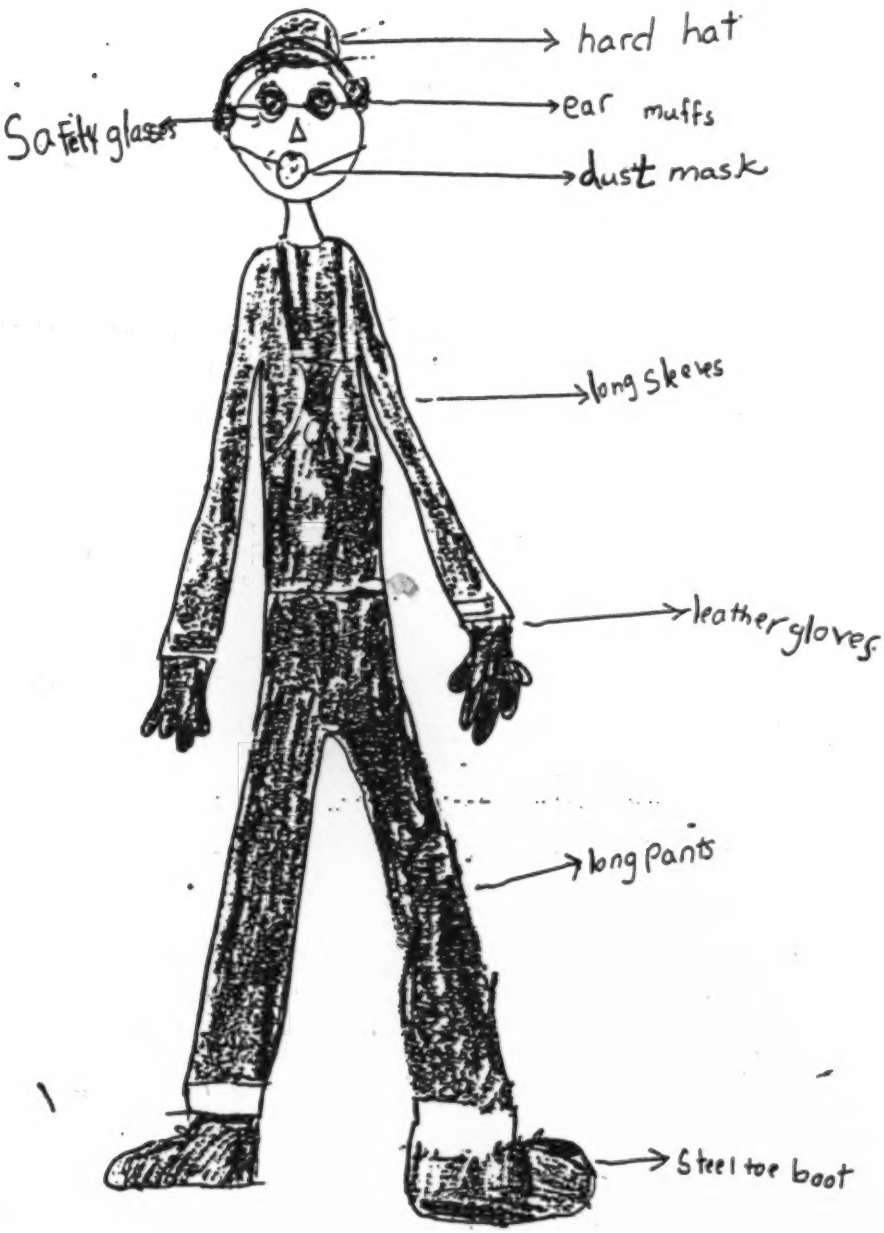
6.

Body Clothing

You should always wear Pants and a long Shirt to protect your Skin from Scratches. You never wear Short Sleeves, or Shorts. Also, never wear baggy clothing because it can get caught on the machines.

1

7.


hard hat
ear muffs
Safety glasses
dust mask
long sleeves
leather gloves
long pants
Steel toe boot

8.

Name:_____

Thinking About My Work

Activity: Report On Tools In The Past

1. Research Should Answer The Following Questions 1 2 3 4 5
   - -What is the name of the tool?
   - -What is the tool used for?
   - -How is the tool used?
   - -What materials are used to make the tool?
   - -How is the tool different from today's tool?
   - -What is interesting and unique about the tool?

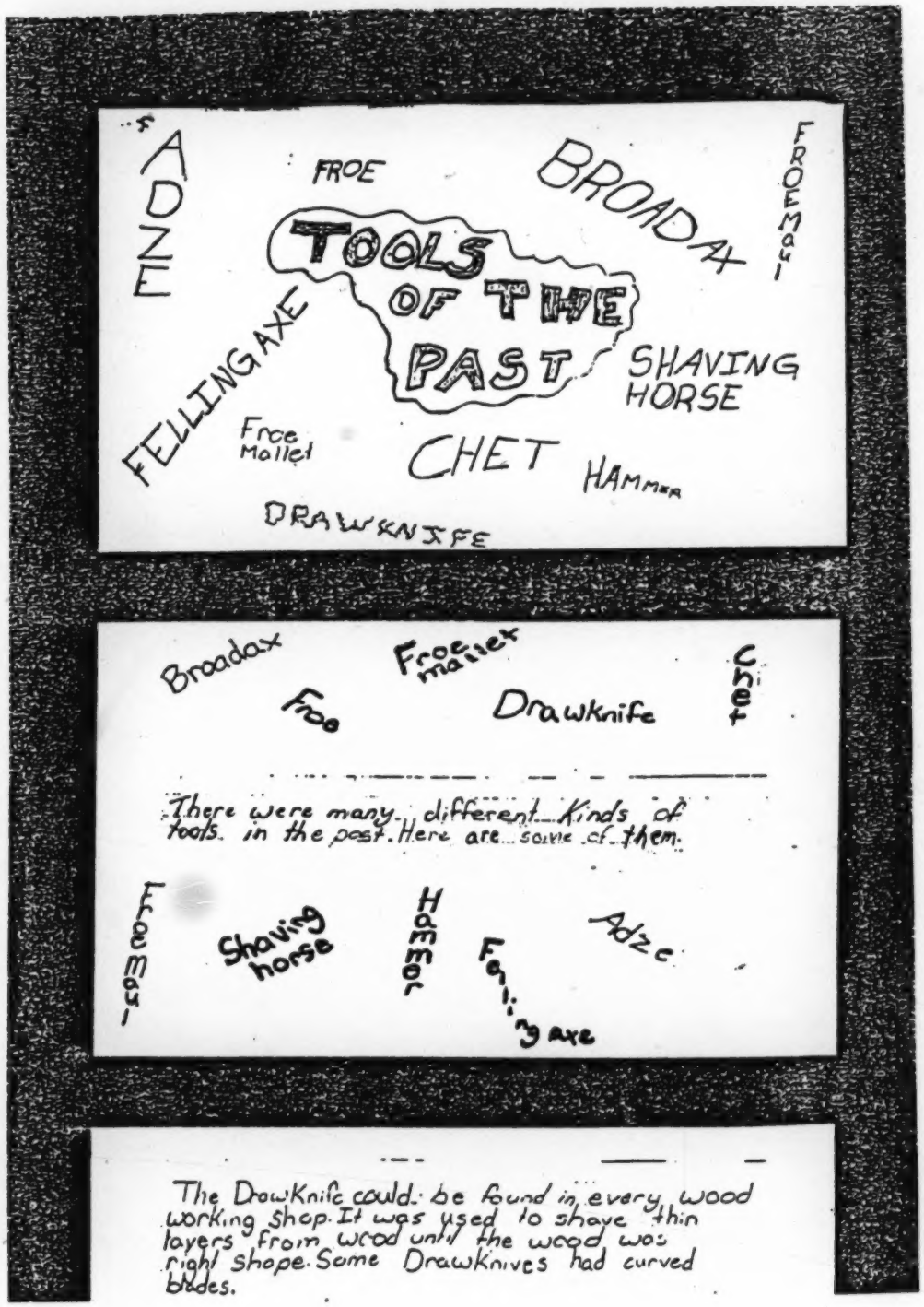
   Comments:

2. Report 1 2 3 4 5
   - -Choose interesting and unique tools
   - -Reader learned about tools from reading report
   - -Student used own words
   - -A lot of information and detail is included
   - -Writing keeps reader's interest
   - -Writing is organized and easy to understand by reader

   Comments:

3. Presentation 1 2 3 4 5
   - -Presentation is neat, organized and attractive
   - -Drawings are included
   - -Details and colors in drawing are accurate

   Comments:


ADZE
FROE
BROADAX
FROEMALL
TOOLS OF THE PAST
FELLINGAXE
SHAVING HORSE
Froe Mallet
CHET
HAMMER
DRAWKNIFE
Broadax
Froe mallet
Froe
Drawknife
Chet
There were many different kinds of tools in the past. Here are some of them.
Froe Mall
Shaving horse
Hammer
Adze
Felling axe
The Drawknife could be found in every wood working shop. It was used to shave thin layers from wood until the wood was right shape. Some Drawknives had curved blades.

The DrawKnife could be found in every wood working shop. It was used to shave thin layers from wood until the wood was right shape. Some Drawknives had curved blades.

Drawknife

Drawknife

Drawknife

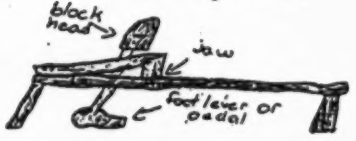
Draw Knife

Drawknife

D&W knife

The Shaving Horse was a carpenter bench that allowed wood workers to sit as they shaped a peice of wood. The pedal locked the wood securely under the jaw of the bench and released it when the peice was finished.

Shaving Horse



Shaving Horse

Shaving Horse

Shaving Horse

Shaving Horse

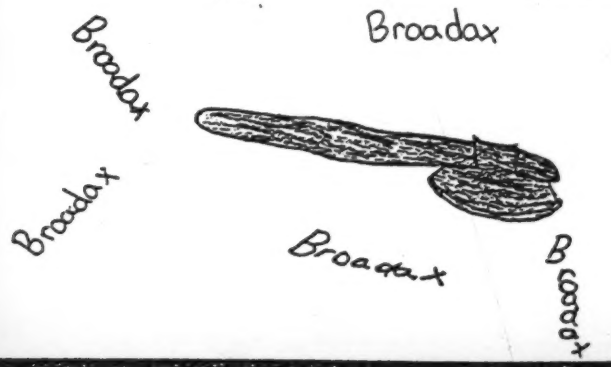
The Broadax is strong enough to cut through hard wood logs.

Broadax

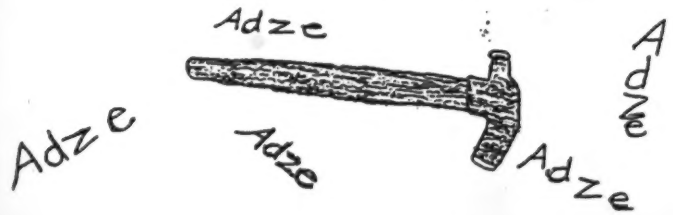
Broadax

Broadax

The Broadax is strong enough to cut through hard wood logs



The Adze was used for making round logs square by chipping away bits of wood. The squared logs were also then cut using a pit saw. The Adze was also useful for hollowing out logs



Building a House in the Past

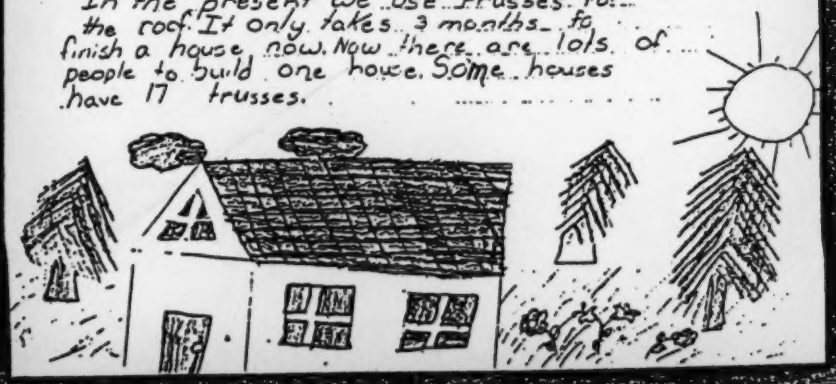
In the past you needed to chop down lots of trees to build a house. The people in the past built there own houses and they didn't hire people. It use to take a year to finish a house in the past

Building a House in the Past

In the past you needed to chop down lots of trees to build a house. The people in the past built there own houses and they didn't har people. It use to take a yeer to finish a house in the past.

Building a House in the Present

In the present we use trusses for the roof. It only takes 3 months to finish a house now. Now there are lots of people to build one house. Some houses have 17 trusses.



Name:_____

Thinking About My Work

Activity: Report On Buildings In The Past

1. Research Should Answer The Following Questions 1 2 3 4 5
   -How are they different from buildings today?
   -What materials were used to build the building?
   -What tools were used to build the building?
   -What construction techniques were used to build the building?
   -What are some interesting and unique features about the building?

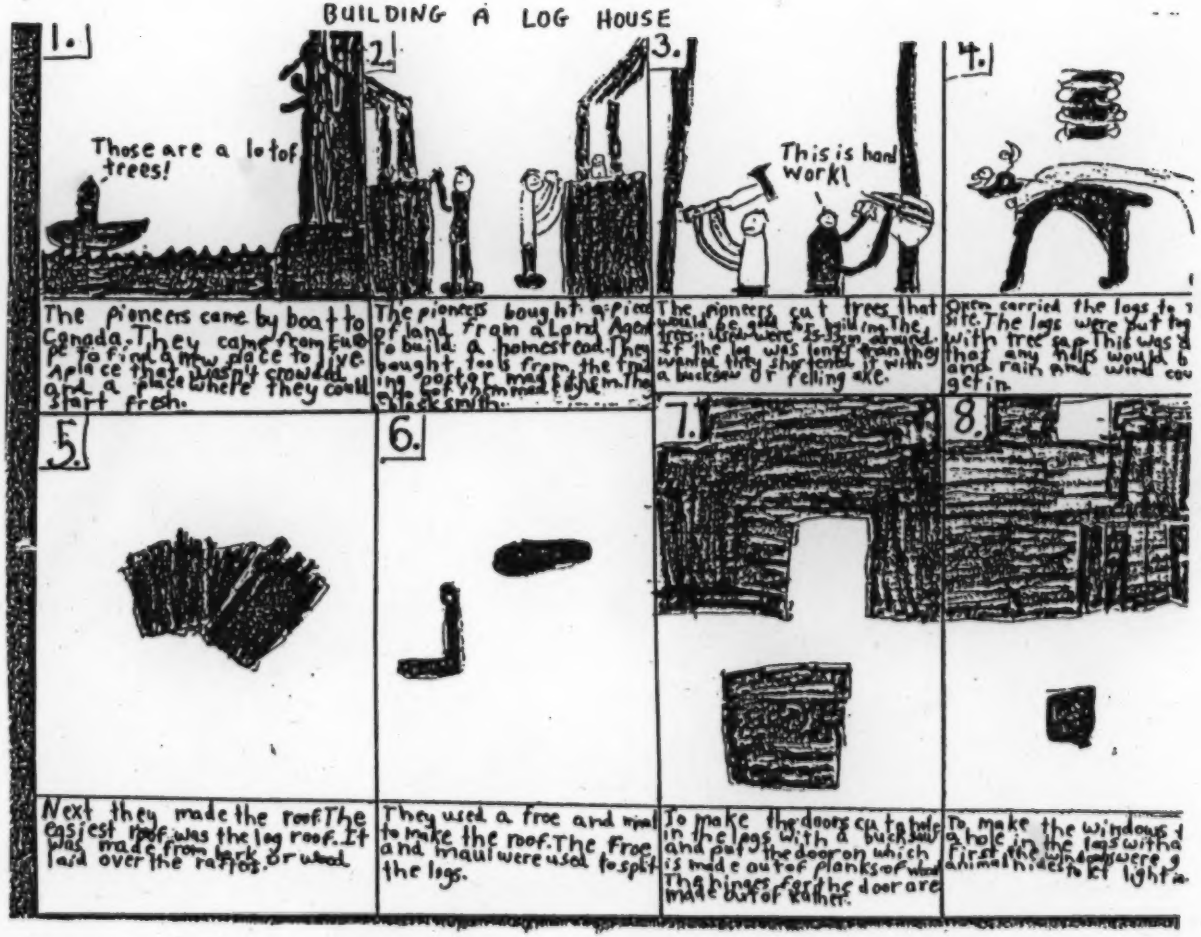
   Comments:

2. Report 1 2 3 4 5
   -Student used own words
   -A lot of information and detail is included
   -Writing keeps reader's interest
   -Writing is organized and easy to understand by reader

   Comments:

3. Presentation 1 2 3 4 5
   -Presentation is neat, organized and attractive
   -Drawings are included
   -Details and colors in drawing are accurate

   Comments:


BUILDING A LOG HOUSE
1.
Those are a lot of trees!
2.
3.
This is hard work!
4.
The pioneers came by boat to Canada. They came from Europe to find a new place to live. A place that wasn't crowded and a place where they could start fresh.
The pioneers bought a piece of land from a Lord Again to build a homestead. They bought tools from the trading post. Some of them had their own blacksmith.
The pioneers cut trees that would be good for building. The trees were 25-35cm around. If the log was longer than they wanted, they shortened it with a bucksaw or felling axe.
Once carried the logs to the site. The logs were put together with tree sap. This was done that any holes would be filled and rain and wind could not get in.
5.
6.
7.
8.
Next they made the roof. The easiest roof was the log roof. It was made from bark or wood laid over the rafters.
They used a froe and mallet to make the roof. The froe and maul were used to split the logs.
To make the doors cut two holes in the logs with a bucksaw and put the door on which is made out of planks of wood. The hinges for the door are made out of leather.
To make the windows cut a hole in the logs with a saw. First the window was covered with animal hides to let light in.

The Homestead

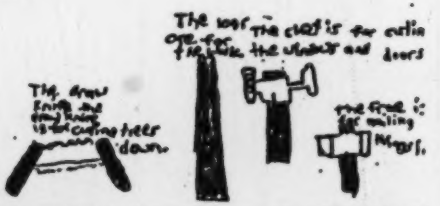
1

A pioneer came across the ocean to canada to start a new life.

2.

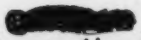
When he got to Canada he bought a piece of land and he started to clear the land.

3.



He needed a lot of tools. I will get my tools from the local black smith. I will need a chainsaw, saw, axe and chop trees down for my cabin.

4

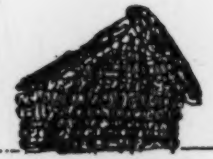


They began to build their cabin. They started off with 2 foot logs for the foundation of the house.

5.

Two weeks later they had the walls up. But we have to do the roof.

6



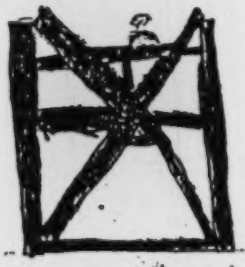
The next day I will have to put the roof on the cabin. All of my clothes will be out of animal skins that are greased.

The Barn

7.

The barn will take a lot of people. It will take about 20 people to build a barn. The first thing we will do is the foundation. The foundation is the base of the building.

8.

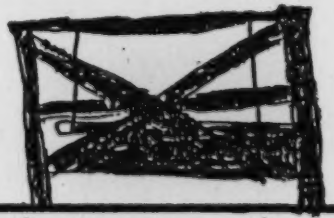


The next thing you will see is the frame. The frame is the form for the building. Many tools will ropes to that will go up on the ropes to the top of the building.

9.

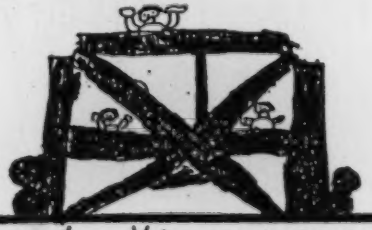
They needed a lot of materials like to planks as well as saw trees and an adze to shape the wood.

10.



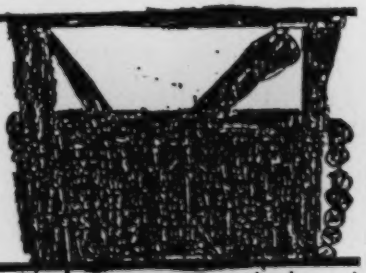
I will need a rope to bring the logs up higher to the top of the barn. They needed a draw saw and a buck saw to cut the windows and doors.

11.



The next thing you have to do is to put up the logs for the walls.

12.



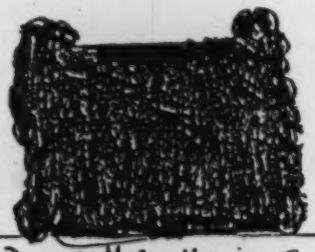
Month it will take of hard work to make the out side of the barn and the roof.

I will need rope to bring the logs up higher to the top of the barn. They needed a iron saw and a buck saw to cut the wood.

The next thing you have to do is will be putting up the logs.

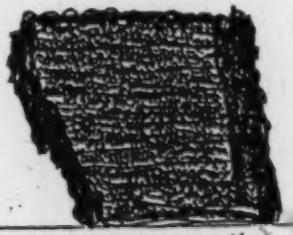
I guess it will take a lot of hard work to make the out side of the barn and the roof.

3.



In 2 months the frame and the walls are finished. The next thing is the roof. The framing the roof will need 15 spruce logs

4.

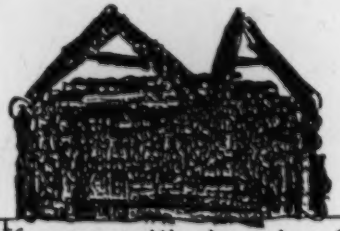


It will take another month to frame the roof. The roof needs 40 logs for the trusses

5.

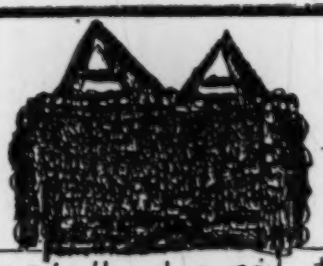
The next thing you have to do is put on the roof of the barn.

6.



The trusses will be 6 feet long on both sides. Then you make a out doors & windows. The doors will be made out of planks and the windows will be made from greased animal hides.

7.



We will cut the door and the windows open with the chet.

8.

The last thing you do is put on the shingles. We will need 1800 shingles needed. We need to cut the shingles ourselves.

Name:_____

Thinking About My Work

Activity: Report On A Famous Building

1. Research Should Answer The Following Questions 1 2 3 4 5
   - -When was it built?
   - -Why was it built?
   - -Where is it?
   - -Who had it built?
   - -What materials were used to build it?
   - -What are some interesting facts about the building?

   Comments:

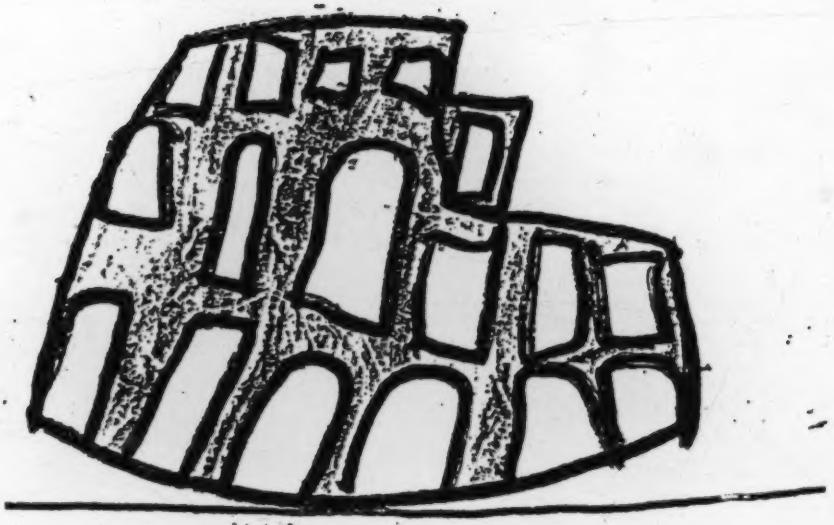
2. Report 1 2 3 4 5
   - -Student used own words
   - -A lot of information and detail is included
   - -Writing keeps reader's interest
   - -Writing is organized and easy to understand by reader

   Comments:

3. Presentation 1 2 3 4 5
   - -Presentation is neat, organized and attractive
   - -Drawings are included
   - -Details and colors in drawing are accurate

   Comments:

A Report On The Colosseum



Location

The Colosseum was built in Rome Italy.

Description

The Colosseum is about 2,000 years old. It has survived a lot of earth quakes. It is 187 feet (57m) high and almost 1,730 feet (527m) around the wall.

Who Built It? The Roman emperor Vespasian ordered the Colosseum to be built. The Colosseum is 1925 years old. The Colosseum was built for special events like gladiators to fight each other. It took eight years to build the Colosseum.

Why was it built?

The Colosseum was built for gladiators to fight each other. Boxing, swordswomen and chariot races were held in the Colosseum.

Interesting Facts

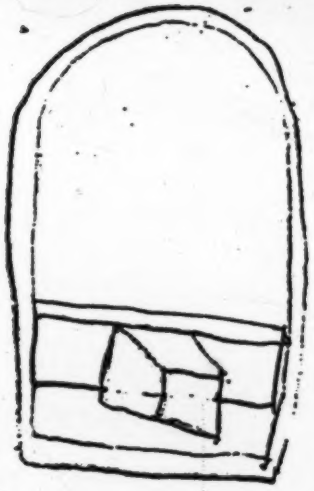
There are lions that fight the gladiators. There is a canopy that covers the sun so it doesn't get in the people's eyes. There are cages under ground for animals and criminals. The Colosseum is oval. One of the best events was a sea battle. They flooded the Colosseum and 100 ships fought and 19,000 men fought.

Parts of the Colosseum

The Canopy

A canopy to block the sun.

The Windows

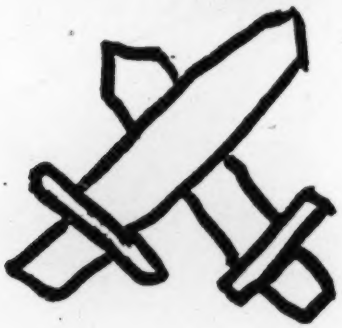


Windows for light.

Pulleys

pulleys to pull up the cages.

Sord



Swords to fight.

Cage

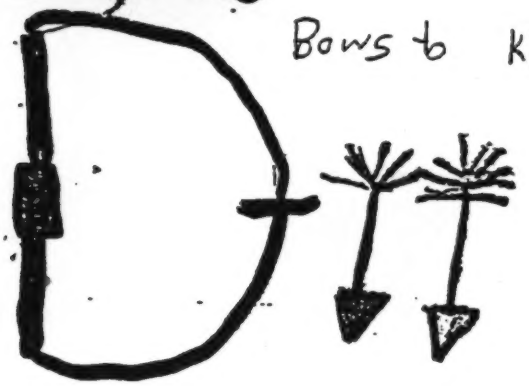
Cages for lions.

GLADIATOR

gladiators to fight.

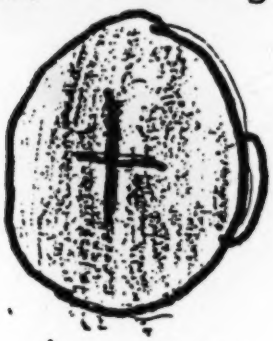
Lion lions to fight gladiators.

Bow Bows to kill people.



Sheild

This is a gladiator's shield.



Carriage

carriage for Chariot races.

Name:_____

Thinking About My Work

Activity: Venn Diagram About Modern and Old-Fashioned Tools

1. Research 1 2 3 4 5
   - -What is the name of the tool?
   - -What is the tool used for?
   - -What is the tool made from?
   - -What is interesting and unique about the tool?

   Comments:

2. Venn Diagram 1 2 3 4 5
   - -Report highlights differences and similarities between modern and old-fashioned tools
   - -Information is correct
   - -Student used own words
   - -Reader learned something about modern and old-fashioned tools from reading the Venn diagram

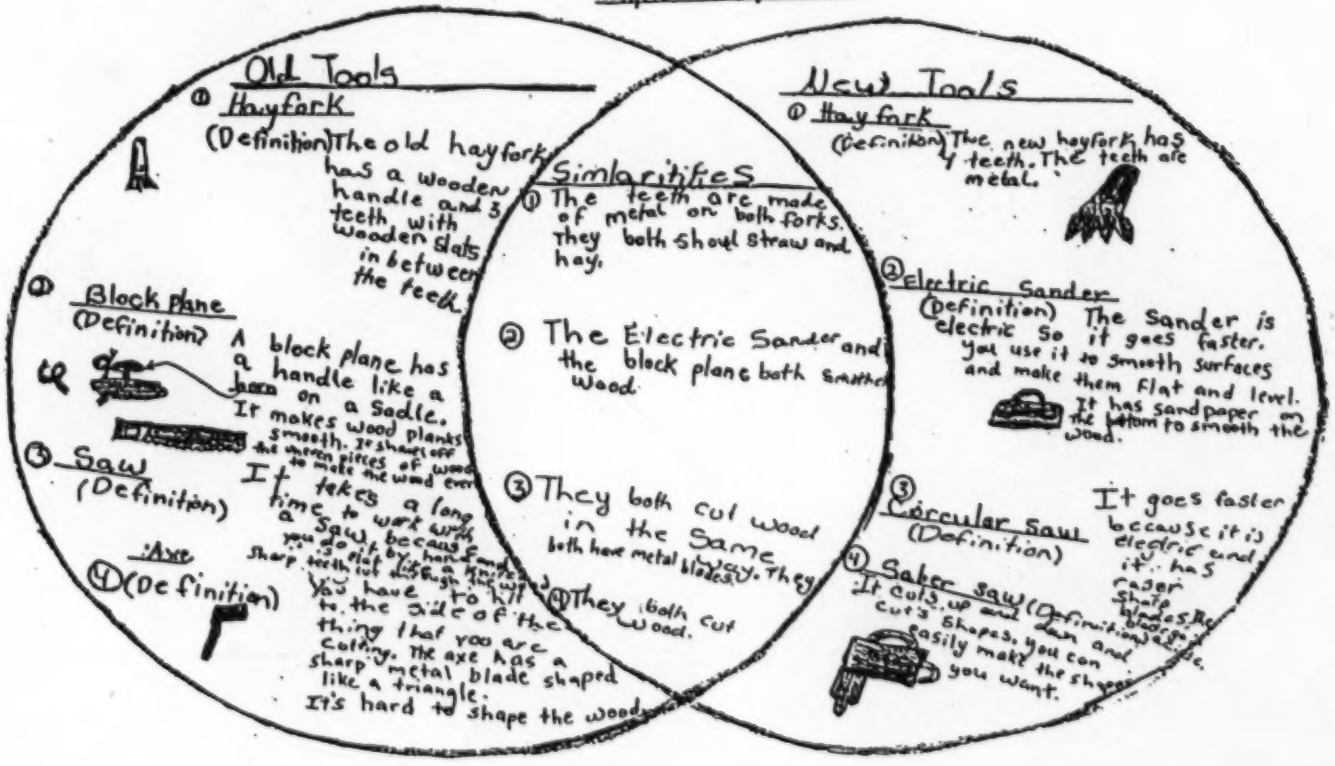
   Comments:

3. Presentation 1 2 3 4 5
   - -Presentation is neat, organized and attractive
   - -Venn Diagram format is followed
   - -Drawings/Pictures are included
   - -Details and colors in drawing are accurate

   Comments:

Venn Diagram On Old and New Tools

April 27th 1997


Old Tools
① Hayfork
(Definition) The old hayfork has a wooden handle and 3 teeth with wooden slats in between the teeth.
② Block Plane
(Definition) A block plane has a handle like a horn on a Sadle. It makes wood plants smooth. It shaves off the uneven pieces of wood to make the wood even
③ Saw
(Definition) It takes a long time to work with a saw because you do it by hand and you do it flat through the wood. You have to hit the side of the thing that you are cutting. The saw has a sharp metal blade shaped like a triangle. It's hard to shape the wood
④ Axe
(Definition)
Similarities
① The teeth are made of metal on both forks. They both shovel straw and hay.
② The Electric Sander and the block plane both smooth wood.
③ They both cut wood in the same way. They both have metal blades.
④ They both cut wood.
New Tools
① Hayfork
(Definition) The new hayfork has 4 teeth. The teeth are metal.
② Electric Sander
(Definition) The Sander is electric so it goes faster. You use it to smooth surfaces and make them flat and level. It has sandpaper on the bottom to smooth the wood.
③ Circular Saw
(Definition) It goes faster because it is electric and it has razer sharp blades. Be careful.
④ Saber saw (Definition) It cuts up and down and cuts shapes. you can easily make the shapes you want.

Peer Evaluation

Peer Evaluation

Description

The class developed an evaluation form to evaluate individual or group presentations of project work. The evaluation focused on each presenter's ability to: 1.) show evidence of new learning 2.) answer questions about the topic 3.) use own words when presenting. Each category was rated from one to five. One being low and five being high.

Purposes

*to give the children an opportunity to experience and understand peer evaluation
*to provide the children with feedback from their peers about their presentation
*to establish criteria for project work presentations
*to establish criteria which the teachers could use to evaluate project presentations

Classroom Practice

In order to give the children an opportunity to share their learning and to practise their public speaking skills, each child was required to present their Phase Two project work. Class discussions were held focusing on effective presentations. We discussed the importance of preparation, eye contact, props, voice, time limit and maintaining audience's interest. The class also discussed the audience's responsibilities which included politeness, attentiveness, objectively evaluating the presentations, making constructive comments and clapping for each presenter. On average, four children presented each day. The presentations took a total of seven days to complete.

Opportunities for Assessment and Evaluation

Because the children knew beforehand the criteria by which they would be evaluated, they were thus able to practise their presentation ensuring that they addressed each element. After each presentation, the children were given time to evaluate their peers' work. They rated their peers from one to five on the three categories: 1.) Evidence of Learning 2.) Ability to Answer Questions 3.) Used Own Words. The children were also required to include constructive comments about the presentation. When all the evaluation sheets were filled out they were collected, sorted and handed back to each presenter. All presenters received their evaluation from their peers allowing them to see how they were evaluated in each category and read the comments about their presentation. Marie and I also evaluated each child using the same evaluation criteria. We also handed our evaluation back to the children in order that they could see how we had evaluated them.

Strengths and Challenges of Peer Evaluation

Strengths:

*children were involved in determining and describing the criteria by which they would be evaluated on their presentation
*children were aware of the criteria by which they were to be evaluated before they did their class presentation
*expectations for presentations were clearly stated in language the children understood

Challenges

*some children had difficulty objectively evaluating presentations. They tended to evaluate the person rather than the presentation.

*evaluation of presentation is limited to criteria set out on the evaluation form. Some presentations may include elements not listed on the form. These elements would not be taken into consideration for the evaluation.

Peer Evaluation Sheet

SHARING OUR LEARNING-PRESENTATION OF PHASE 2 ACTIVITY

Presenter:_____

Activity:_____

1. EVIDENCE OF LEARNING 1 2 3 4 5
-details, information, research included -information is accurate
-audience learned something -able to cite resources used

2. ANSWER QUESTIONS 1 2 3 4 5
-can answer questions about activity and research -answers are accurate
-can make an educated guess based on research

3. USE OWN WORDS 1 2 3 4 5
-uses own words to present research and activity

4. COMMENTS

****

Presenter:_____

Activity:_____

1. EVIDENCE OF LEARNING 1 2 3 4 5
-details, information, research included -information is accurate
-audience learned something -researcher is able to cite resources used

2. ANSWER QUESTIONS 1 2 3 4 5
-can answer questions about their activity and research -answers are accurate
-can make an educated guess based on research

3. USE OWN WORDS 1 2 3 4 5
-uses own words to present research and activity

4. COMMENTS

Portfolio and Project Self-Evaluation

Portfolio and Project Self-Evaluation

Description

A questionnaire was designed to help the children organize and self-assess their portfolio of project work. The children had to select samples of their best project work and explain why they had selected each particular piece and what they wanted their teachers to notice about that selection. The questionnaire also included a section of questions requiring the children to think about the skills they had acquired during the project.

Purposes

*to help the children focus their self-assessment of their portfolios
*to help the children identify samples of their best work that they wanted evaluated by their teachers
*to help the children realize the enormous amount of work they had accomplished over the course of the project
*to encourage reflection on the skills acquired during the project
*to give the teachers selected pieces of project work to evaluate
*to give the children an opportunity to highlight pieces of their work that might otherwise have gone unnoticed or undervalued

Classroom Practice

The final activity of the "Building Project" involved the children in a self-assessment of their portfolio work and skills acquired during the course of the project. Marie and I designed a questionnaire which was handed out to the children on the last day of the project. At this time, the children had their portfolio of project work in front of them. All work done during the project was in the portfolio: field notes, learning logs, plans for phase one and phase two activities, phase one and phase two activities, rough copies, observational drawings, self-evaluations, peer evaluation and project study

sheet. We began by organizing the portfolios. The children used a checklist to ensure that each requested item was included in their portfolio and placed in the right section. It was important that the children's portfolios were organized because Marie and I would be going through them later on and looking for various pieces of work that the children wanted us to evaluate. Once the portfolios were organized, the class spent a good deal of time discussing the portfolio questionnaire. We went over each question in detail and discussed what it entailed. Marie gave examples of possible replies and encouraged the children to orally share their responses with the class. Expectations for a thorough and thoughtful reflection were clearly communicated to the class. Marie stressed the importance of taking time to reflect, go through the portfolio and examine all work and answer the questions. She also told the children that it was necessary to include as much information as possible when answering the questions and giving explanations. Following the class discussion, the children were given a large block of time to look through their portfolios, reflect and fill out the questionnaire. When the questionnaire was completed, Marie and I looked over them to ensure nothing had been overlooked and that the children had put thought and detail into their responses. Children who needed additional time to complete the portfolio and project self-assessment were given it. Marie and I also met and talked with those children who needed further direction in order to complete their self-assessment. After all questionnaires were handed in, Marie and I went over each one and used the children's responses to help make final assessment and evaluation judgments.

Opportunities for Assessment and Evaluation

By the end of the project, the children had participated in an enormous number of activities and produced a great quantity of work. Although Marie and I had seen most of the children's work throughout the project, due to the sheer volume of work produced by each child and the fact that there were thirty children in the class, we had not been able to assess and evaluate every piece of project work. The portfolio and project questionnaire allowed the children to select pieces of work which they felt exemplified their best effort. Marie and I then used their selections to go through their portfolios and collect additional assessment and evaluation data. Their selections helped focus our assessment and evaluation of their portfolios. The children had valuable insights and comments regarding their project work and the skills they had acquired. Without their input, some of their learning would have gone unnoticed or undervalued.

Strengths and Challenges of Portfolio and Project Self-Evaluation Form

Strengths:

*gave children structure and direction for self-assessing their project portfolios
*gave teachers direction for selection of portfolio items to assess and evaluate
*gave teachers insights into children's perceived strengths and weaknesses

Challenges:

*time-consuming. Children needed a large quantity of time in order to go through the portfolio, select items and fill out questionnaire. A lot of time was also needed to discuss expectations concerning the portfolio review and self-assessment.

*self-assessment is developmental. Not all children are able to effectively and objectively self-assess their work. In addition, some children are not willing to put in the effort required to do so either.

Portfolio and Project Self-Evaluation Form

Looking At My Portfolio

Name:_____

Look through your portfolio of work. Organize your work samples.

Inside your portfolio should be:

- *fieldnotes ✓
- *learning log ✓
- *plans for phase 1 and 2 activities ✓
- *rough copies of phase 1 and 2 activities ✓
- *self-evaluation of phase 1 and 2 activities ✓
- *peer evaluation of phase 2 presentation ✓
- *study sheet

****

After having looked through your portfolio and organized it, answer the following questions.

Ⓐ Choose your best sample of fieldnotes. Topic: Mr. Boucher Tools and Tool Safety.
What makes it better than your other fieldnotes?
They are very organized. Lots of information Good because it teaches you tool safe for everyone
What would you like your teacher to notice about these fieldnotes?
How much information I have down.
How detailed my work is.

Ⓑ Choose your best sample of a learning log entry.
Topic: Tools and Tool Safety. Date April 16, 1997
What makes it better than your other entries?
lots of information I could teach
lots of details someone with my en
What would you like your teacher to notice about this entry?
details lots of information.
I really listened during the presentations

Ⓒ During the building project, what activity helped you learn the most about building? Activity The Eiffel Tower Phase 2
Why? What does it show about your learning? Because I researched it. I learned it is 984 feet tall. It is made of wrought-iron. I knew how to research. I learned how to write a report. I also

learned how to ~~draw~~ sketch famous buildings.

Ⓓ Is there any other work in your portfolio that you would like your teacher to look at? Activity My Report On The Eiffel Tower

What would you like your teacher to notice about this piece of work?
-Detail. -Research -Hardwork. -Took awhile to do. -Didn't get it out of my head

Ⓔ What skills do you think you improved the most during the building project? My research and detail in my and presentation skills and team work. with Stephanie in P

Ⓕ What skills would you like to work on in your next project? I.
Organication. Neatness. Stand still during my presentation.

Ⓖ What did you like best about the building project? Why?
When guests come in and birdhouse building. Because it is interesting and I like to build

Ⓗ What questions do you still have about building?
When was West Ed built?
What was the Statue of Liberty built for?

Ⓘ Give yourself a mark on your work, attitude and participation during the building project.

WORK	1	2	3	(4)	5
ATTITUDE	1	2	3	(4)+	5
PARTICIPATION	1	2	3	(4)+	5

Comments:

I really enjoyed it and learned a lot of things about building.

Project Study Sheet

Project Study Sheet

Description

At the end of the project, the children helped design a quiz aimed at testing their knowledge on "Building." All of the children contributed possible questions. Questions were selected and they became the unit quiz given at the end of the project. In order to prepare the children for the quiz, a study sheet containing practice questions was made up and the children worked together in study groups sharing and comparing answers.

Purposes

*to assess the children's knowledge of specific information and skills learned throughout the "Building Project"

*to provide the children with a test-taking experience since they would be involved in the Grade Three Provincial Exams later in the year

Classroom Practice

Marie's children were accustomed to having unit tests at the completion of a unit. Because they would soon be subjected to the Grade Three Provincial Exams, Marie wanted to give them as much practice as possible taking tests. Not to be overlooked either was the fact that the children had learned a great deal of new knowledge about building during the Building Project. In order to give the children an opportunity to share and celebrate their new knowledge, a unit test seemed the best format to serve both objectives: give the children test-taking experience and testing the children's knowledge about "building" acquired during the project.

Marie and I explained to the children that they would have a test at the end of the project aimed at testing some of their learning about "building."

We told the children that rather than Marie and I making up the test, it was going to be their responsibility. Each one of them would be responsible to contribute at least one question for the test. In order to help them frame their questions, Marie and I asked the children, "What knowledge do you think someone in this class should know after having spent the past two months and a half months working on the "Building Project?" We spent a lot of time discussing what made a good question. We gave examples and asked the children to share some of their suggestions. We also discussed the importance of having a variety of questions (who, what, why, when and how questions as well as questions that required the use of higher order thinking skills such as analyzing, summarizing and synthesizing) and questions representing all of the project. As a class we then briefly reviewed the building project, talking about the various field sites we had visited, guest visitors who had shared their expertise and numerous activities that we engaged in throughout the project. This reminiscing help set the stage for the question brainstorming session. As the children suggested possible test questions, the questions were recorded on chart paper. We stopped every so often to review the questions and direct the children's brainstorming into areas of the project that were being presently overlooked. At the end of the brainstorming session, Marie and I gave the children additional time to write down any questions they still wanted to submit. The questions were then collected up and Marie and I sat down and chose the ones that we felt would make the best test material.

The children had brainstormed some wonderful questions. Their questions showed that they had learned a lot about "building" during the project. In order to help the children prepare for the unit test and ensure their success on the test, Marie and I made up a study sheet. We took

selected questions representative of the questions that would be on the unit test and typed them up. The study sheet was handed out to the children and they were told that these were the type of questions that they would find on the final unit test. The children had the choice to work independently or in groups to find the answers to the questions on the study sheet. The children were encouraged to use their field notes, look at displays of their peer's work and discuss with others in order to find the answers to the questions. As a class, we gathered regularly and discussed questions and answers. During these sharing sessions, Marie and I took turns writing notes on the board so that the children could copy any missing information they needed. The children were given one week to fill out their study sheet and prepare for the unit test. They were given time in class each day and were also told that the study sheet could also be brought home. A note was sent home to the parents to let them know that the children would be having a unit test and that they had a study sheet to help prepare them for the test. Toward the end of the project, the children were given the unit test. The tests were marked and returned to the children. The class discussed the test and went over the answers to all questions. The children were responsible to make any corrections and share them with Marie or myself. The children did exceptionally well on the test. Several children scored 100% and the class average was 89%.

Opportunities for Assessment and Evaluation

The children had many opportunities to demonstrate and share the various skills and attitudes they had acquired throughout the project: class presentations of their Phase One and Phase Two activities, displays of their

work hung on bulletin boards both inside and outside the classroom and several self-assessment and evaluation sessions had been engaged in during the project. The children's learning logs, class discussions and observation revealed that in addition to the numerous skills and attitudes acquired and refined throughout the "Building Project," the children had also acquired a lot of factual information about the topic "Building." The study sheet and unit quiz provided an opportunity for the children to highlight some of that learning in a more traditional manner. The study sheet provided Marie and I a quick method of assessing learning that children still had difficulty articulating or that some information was lacking. Marie and I were then able to address these areas in our instruction. Class discussions were held, resources were brought in and lessons reviewed. When the children wrote the unit test, we had another opportunity to assess which areas still need further time and attention.

Strengths and Challenges of Project Study Sheet

Strengths:

*children had an opportunity to give to determine content and design of test
*quick and efficient way to assess depth of children's factual knowledge
*children knew beforehand the content of the test. Therefore, every child had an opportunity to study and do well on the test. Many children made serious effort to study and prepare for the test.
*parents were made aware that children would be having a unit test. Several parents spent additional time with their children reviewing notes and studying for the test

Challenges:

*can only test factual knowledge, knowledge that can be shown on paper
*test taking is an acquired skill. Children need a lot of practice, modeling and guidance in order to understand how to best perform
*creating a fair test is a complicated procedure

Project Study Sheet

Building Project Study Sheet

Name: _____

Here are the questions that your class selected for the quiz at the end of the building project. You should be able to answer all these questions. In order to prepare for the quiz you should write down the answers to the questions and use them to study. Read the questions carefully!!

① Vocabulary - Give a definition for the following words.

a) blueprint A blue print is a piece of paper that gives you instructions to build something. It is the plan.

b) diagonal A diagonal is a piece of wood that supports a squ. It devides it in triangles.

c) arch An arch is shaped as a bow because all of the wa.t in the middle.

d) foundation The foundation is the base of the building.

② Answer the following questions. Include as much detail and information as you can in your answer.

a) How do builders make sure that a building is level?
They get a surveyer to survey the land and see if it is level

b) How is a bridge built over a river?
You need to dig a hole and drain the water. Then the put in the poles and put the water back. Then they bui the brid

c) Why do roofs have shingles?
So no water or snow can get in and so the wood won't rought

③ Draw and name 4 different types of bridges.

a) arch

b) beam

c) Suspenchtion

d) Cantilever

④ Name and describe 4 different types of safety equipment that builders use.

Equipment	Description
a) Safety glasses	Safety glasses protect your eyes from wood chips.
b) hard hat	It protects your head from falling objects.
c) steel toe boots	They protect your feet from heavy objects.
d) harness	A belt that goes around your waist that keeps you from falling off a building.

⑤ Draw a truss and explain why and how it's used for building.

Drawing	Explanation
	The trusses are used to keep the roof from falling. All the preashure goes to the s es that's why you need little friangles in the middle.

⑥ Describe 3 things that need to be done before a builder begins building.

a) survey the land

b) get a building permit

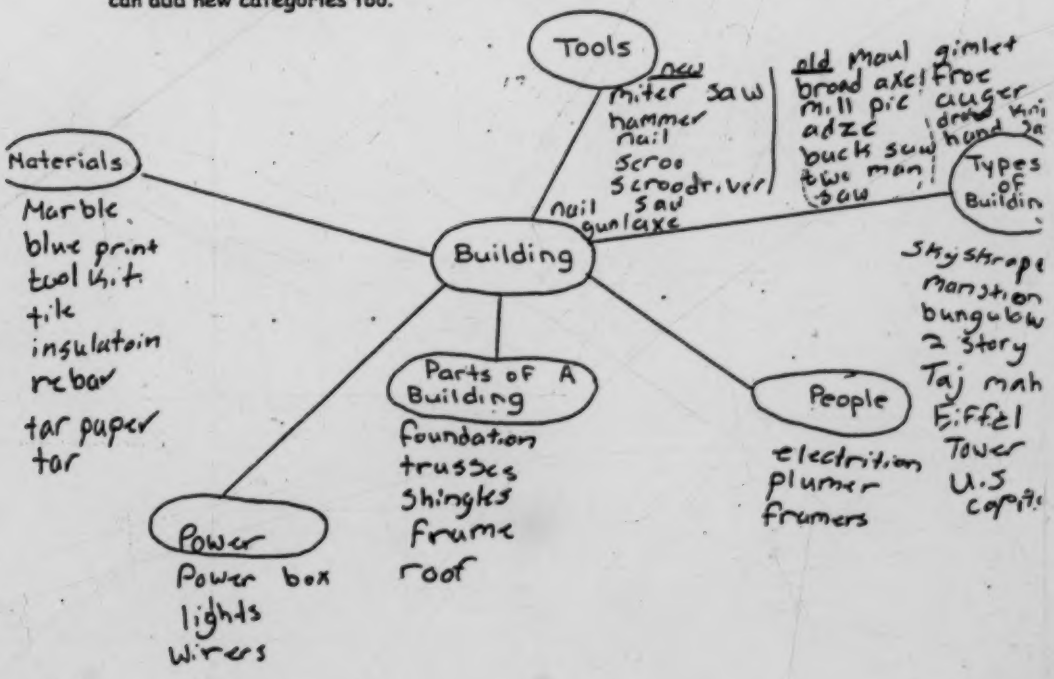
c) need a blue print

⑦ Compare a pioneer home to your home. Name at least 5 differences. Focus on the materials, tools and construction techniques used to build the home.

Pioneer Home	My Home
a) - windows made from greased animal hides	- glass windows

b) The door hinges made from leather	hinges made from metal
c) one room	many room (bigger)
d) oil lamps	electricity
e) beds were made from strew	new mattresses r

* ⑧ Complete the web. Add as many words as you can under each category. You can add new categories too.



(9) List 3 interesting facts about a famous building.

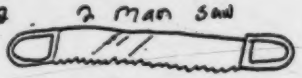
Famous Building: Taj mahal

a) made of white marble
b) 43 types of gems used to decorate
c) in India

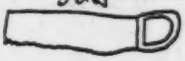
* (10) Draw and describe 2 different old-fashioned tools.

Drawing

a) 2 man saw



b) saw



Description

A 2 man saw has two handles on it so two people can use it. It can't be used by one person

A saw is diffrent from a 2 man s because only one person can use, It is used for cuting wood.

(11) Name 3 things that surveyors do before a builder begins building.

a) They survey the land to see if it's level.
b) Survey the land to check property boundrys
c)

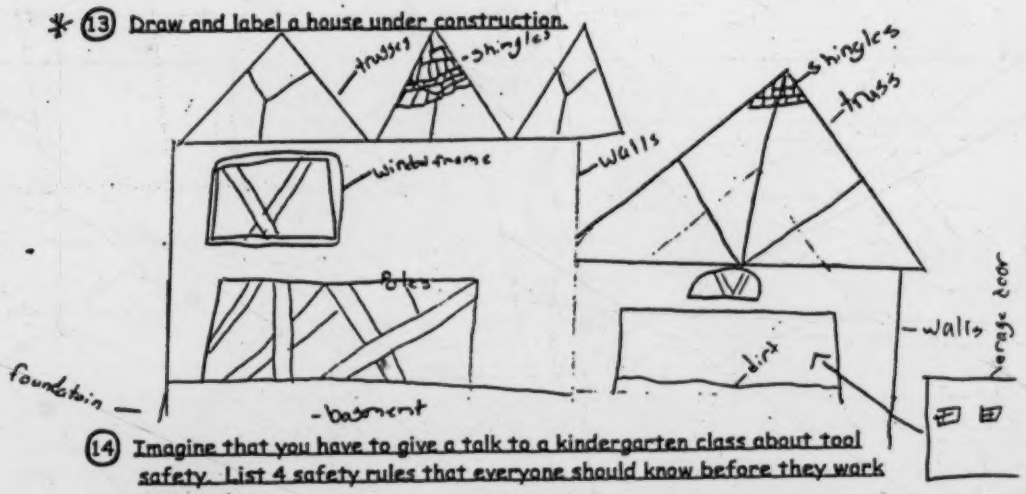
(12) List 5 important steps in building a house, skyscraper or building.

a) Survey the land
b) get a building permit
c) Blueprint

d) Skyscraper need to be fireproofed

e) Wire mesh between floors for concrete

* (13) Draw and label a house under construction.



(14) Imagine that you have to give a talk to a kindergarten class about tool safety. List 4 safety rules that everyone should know before they work with tools.

a) Hold a nail on the inside of your first two fingers.

b) Don't wear baggy clothes. They can get cot in machines.

c) Know how to use a tool before you touch it.

d) Wear safety equitment always.

Anecdotal Notes

Anecdotal Notes

Description

Throughout the "Building Project" anecdotal notes served as an important and essential method of collecting assessment data. Lilian Katz considers anecdotal notes to be the most legitimate type of student assessment. "Intentional observation, as part of your daily routine, is perhaps the most authentic form of assessment" (1996, pg. 56 A Profile of Every Child). Observation of students at work, interacting with peers, talking to parents and Marie; class discussions; informal conversations with students, parents and Marie; as well as more formal interviews with students, all provided valuable assessment data. The notes were recorded in a small hard-covered journal.

Purposes

*to collect additional assessment data on students
*to collect data that could not be collected by other means
*to record subtle displays of understanding, achievement, personal connection that might otherwise go unnoticed
*to collect assessment data in a natural, unobtrusive manner

Classroom Practice

At times, I imposed no guidelines on my anecdotal notes. I collected information informally. My only criterion was that each anecdote should pertain to achievement: work, attitude, skills and effort. Notes were taken while I walked around the classroom and interacted with the students, or when I sat at a table at the back of the room and observed an activity, lesson, presentation or demonstration. Other times, when I was more

directly involved in the teaching, I scribbled notes during class breaks or at the end of the school day. Sometimes the notes pertained to individual students and sometimes the notes were generalizations about the class as a whole. I tried to record observations, ideas, thoughts and insights about students that had previously gone unnoticed. The children were aware that I was collecting information about them and recording it in my notebook. Because I had explained to the children what I was doing and why I was doing it, the children seemed very much as ease. They weren't distracted or uncomfortable. In fact, several of them often remarked that I was just taking my "classroom field notes."

Other times, the collection of my anecdotal notes was heavily influenced by predetermined criteria. I focused my observations on specific outcomes. I was looking for evidence of certain proficiencies, skills, attitudes, etc. I then recorded notes specifically related to these selected criteria. For example, during Phase One, my observation of students was focused on each child's ability to:

a) listen to the ideas of others
b) contribute ideas, suggestions, opinions, thoughts and questions to class discussions
c) share past experiences about topic of study
d) share past knowledge about topic of study
e) select and design an appropriate phase one activity.

I therefore collected data that showed evidence of these abilities.

During Phase Two, I continued to collect both informal and formal anecdotal notes. My informal observations followed the same format as described previously. My more formal observations for Phase Two focused on collecting evidence of the same abilities as noted for Phase One, with the replacement of c and d with:

c) share new experiences about topic of study
d) share new knowledge about topic of study

During Phase Three, the focus for my anecdotal notes centered around collecting evidence of children's different overall experiences of and learning about the topic "Building." I collected their stories as they celebrated their learning with their classmates, parents and other invited guests.

Opportunities for Assessment and/or Evaluation

A carefully documented record of significant events can be one of the most useful pieces of assessment and evaluation data. The anecdotal notes taken during the project provided both assessment and evaluation data throughout the entire duration of the project. During the course of the project, anecdotal notes provided assessment data that helped to shape the course of the project. Notes recorded gave insights into children's interests, strengths and areas for growth. Instruction and activities were thereby altered to best suit the children's perceived needs. Anecdotal notes also provided assessment data that was used to make evaluative comments about children at the end of the project. When a piece of information pertaining to a particular student was identified as being especially insightful or helpful, this information was copied from the journal onto a sticky note and placed in the student's file folder. By the end of the project, each student's file folder contained many notes about their achievement, behaviour, attitude, etc. The notes supplied valuable evidence which helped support conclusions made about a child's achievement, attitude

and effort during the course of the project.

Strengths and Challenges of Anecdotal Notes

Strengths:

*provide valuable evidence of student work, attitude, effort not available through paper-and-pencil tests or other assessment and evaluation methods

*unobtrusive, notes can be taken any time or any where

Challenges:

*time-consuming to collect and organize anecdotal data

*a real effort has to be made to collect data on all students

*need to be specific about what you want to observe in order collect most efficient and effective notes

Chapter Seven

Reflections on Assessment and Evaluation in the Project Approach

This chapter represents my final reflections on assessment and evaluation in the context of project work. The chapter is divided into three distinct sections. Section one highlights my insights and thoughts concerning assessment and evaluation resulting from my study of the Building Project. Section two addresses the research questions that shaped my study and section three offers suggestions for additional assessment and evaluation tools and techniques for project work.

I. Reflecting on Assessment and Evaluation in the Context of Project Work

As a result of my study of assessment and evaluation in the Building Project, I was forced to revisit and revise many of my previous ideas and practices concerning assessment and evaluation . The following section summarizes my thoughts and insights on the topic of assessment and evaluation in the context of project work. I look upon this summary as an opportunity to share with other teachers, and to remind myself, of some of the more important points to consider when addressing classroom assessment and evaluation in the context of project work. Knowing that I would soon find myself back in a project approach classroom and that I would hopefully have some opportunities to share with colleagues my beliefs and experiences with assessment and evaluation, I wanted to find a succinct and simple format for explaining my thoughts. The following statements and explanations are the fruit of my research experience. I hope that these reflections might provide some guidance for teachers as they too think about assessment and evaluation in their project oriented classrooms.

(A) Involve children in the assessment and evaluation process

The most significant discovery about assessment and evaluation concerns the role of children in the assessment and evaluation process. Children need to be intimately engaged in all areas of the process. There are a myriad of ways in which children can and should be involved. Foremost, children need to know up front the expectations concerning their work and or behavior. It's only fair that children are appraised of the process by

which they are going to be assessed and evaluated. If we are looking for certain behaviors, attitudes and skills, we need to share this information with the children. Better yet, children should be an integral part of the discussion and/or construction of assessment and evaluation tools and techniques and not apart from it. The children have important insights and suggestions to contribute when asked to share their ideas. When they clearly understand what is being asked of them they are in a much better position to demonstrate it.

One way to ensure that children understand the assessment and evaluation criteria is to make sure that the language is student friendly. If possible, have the children help write or create the assessment or evaluation tool. If that's not possible, make sure that the tool or technique being used is clearly explained and understood by the children. When a class works together to develop assessment and evaluation tools, they are creating more than just criteria by which an assignment can be judged. More importantly, they are developing a common language that the class can use when discussing assessment and evaluation. Everybody has the same framework.

The whole purpose of assessment and evaluation is to help children think for themselves, to help them make better choices. If we want children to be reflective, it's important that we as teachers help them think about how their work is progressing, what they can do to improve it and how they can get to the next level. Children need to be brought into the assessment and evaluation process because it is ultimately what they think about their work that matters most. By excluding children from the assessment and evaluation process, I think we deny them the opportunity to better understand themselves as learners. The ultimate goal of assessment should be to turn the "assessee" into the "assessor." When given guidelines,

practice and a supportive environment, children prove very capable self-assessors. They judge their work with a lot of integrity, intensity and honesty, often being harder on themselves than their teacher would be. Children have a lot to say about their work and we, as teachers, need to provide many opportunities for them to do so. Children need to be at the centre of assessment and evaluation and not on the outside looking in.

(B) Assessment and evaluation need to be an integral part of the planning process at the beginning of a project

Assessment and evaluation need to be planned for at the beginning of a project and not left for until the end, which, unfortunately, is too often the case. It's important for the teacher to have a clear understanding of what she or he wants to assess and evaluate and how she or he is going to carry out the assessments and evaluations at the project's onset. Thinking about the tools and techniques that could best help the children document their learning during the course of the project helps the teacher to identify the primary learning outcomes and thus be better prepared to meet children's needs.

(C) Assessment and evaluation need to influence and improve instruction

What's most important is not so much the choice of the assessment or evaluation tool or technique but rather what is done with the information gained from the tool or technique. The information should be used to influence instruction, thereby working for the benefit of the student rather than just acting as proof for a grade. We need to take the information and

act upon it immediately. Instruction is most effective when it is responsive to students' immediate needs. Improving instruction, repeating and/or restructuring a lesson, addressing misunderstandings, and providing additional help or experiences to the students are all possible ways that assessment and evaluation information can influence instruction.

(D) The importance of using multiple and varied methods of assessment and evaluation

The real strength of the assessment and evaluation tools and techniques used in the Building Project comes not from one single method, but rather from the combination of methods. It is the pieces of information gathered from each assessment tool and/or technique that combine to paint the most authentic portrait of the child's achievement. It's important to choose assessment and evaluation tools and techniques which assess and evaluate both process and product. Anecdotal notes, interviews, learning logs are some of the tools that can help assess process, whereas criteria charts and quizzes can assess product. Using multiple and varied methods of assessment and evaluation presents opportunities to witness both strengths and limitations that might not be visible through a single assessment or evaluation method. Because children have so much to show, it's important that teachers give them as many opportunities as possible to share their potential.

(E) Self-Assessment and evaluation are difficult processes for young children

The ability to reflect objectively on yourself and your work doesn't come easily or naturally to most young students. Children need a lot of guidance, modeling and experience in order to effectively assess and evaluate their work. Having students share their reflections and modeling examples of thoughtful self-assessments seemed to be an effective way to help students learn the process. As a class, going through a reflection together proved to be a very effective exercise. Children's best examples of self-reflection came only after they had had ample opportunity to practice this skill. Also, giving children regular opportunities to look through their portfolios of work allows them to observe, measure and appreciate their progress. When children look back at the work they produced at the beginning of a project, they are usually very surprised and impressed by the quality and variety of their work toward the end of the project. By giving children the tools and opportunity to self-assess and self-evaluate their work, we are teaching children to become responsible for their learning and to be responsible for what is expected of them.

(F) Assessment and evaluation tools and techniques can only capture certain aspects of students' capabilities

I think it is important to realize that no matter how varied your assortment of assessment and evaluation tools is you are still only capturing a small glimpse of a child's potential. It's impossible to see, record and interpret everything a child does. Being selective enables the teacher to choose the assessment and evaluation tools and techniques best capable of

giving the information that he or she is looking for. Since the teacher is only going to capture part of the story at least it should be an important part.

(G) Assessment is Time-Consuming

In order to feel confident students have been accurately assessed and evaluated, the teacher needs to spend a significant amount of time collecting and interpreting assessment data. After a lesson, presentation or class discussion, it's important to spend time asking probing questions, encouraging the children to share their insights and engaging in self-reflecting in order to assess the various skills, attitudes or behaviors displayed by the children. It takes a lot of class time and effort on the part of the teacher to ensure that enough time is devoted to reflection, revisiting and debriefing before assessment and evaluation judgments are made.

(H) Be consistent when using evaluation qualifiers

During the Building Project, children had many opportunities to evaluate their work and the work of their peers. We decided early on that it would be important to use the same rating scale for all evaluation activities. With the children, it was decided that we would use a scale from one to five to evaluate work. One being the lowest and five being the highest. We discussed in detail what each number represented and went over the descriptions before each evaluation. We also modeled using the scale by sharing pieces of work and having the class discuss how they would evaluate that piece of work using the one to five scale. This consistency proved very

effective. The children were able to competently and consistently use the scale on a variety of activities.

II. Answering the Research Questions

Three research questions shaped and guided my study of assessment and evaluation in the project approach.

a) Which tools and techniques can be used to assess and evaluate student work in the project approach?
b) Which features of project work provide opportunities for student assessment and evaluation?
c) What does project work highlight concerning student achievement that wasn't highlighted in more systematic teaching?

As the first two questions have been answered in detail in chapter six, only question three will be formally addressed here.

Because this was Marie's second year as the class' teacher, she already felt she knew her students very well from an achievement standpoint. However, throughout the project, she realized that she continued to add to her understanding of each child's abilities and potential. Because I hadn't known the children before the onset of the project, I was very dependent on Marie's comments and insights concerning the students' achievement during the course of the project as compared to their achievement during more systematic teaching situations. Following is a summary of Marie's three primary observations regarding student achievement during project work:

(A) Students genuinely proud of and excited about their work.

Because students seemed so proud of and excited about their work, they were more willing and likely to share their learning with others. Throughout

the project, many children shared their learning with their families. Children discussed with their families the guest visitors who came to the class, the field visits they went on and their individual project work. Parents commented how excited and enthusiastic their children were about the project. One parent told Marie, "Julie is always coming home telling me about what is going on during the project. She usually isn't this enthusiastic about her work. She insisted that I come today to have a look at all the displays in the hall. I was motivated to come because of all the stuff that Julie has been talking about at home."

(B) Quality of students' work

Marie, along with her teaching colleagues, parents and administration all noticed the high quality of the children's project work. During the Slide Show and Celebration of Learning at the end of the project, one mom stated, "It's hard to believe that they're in grade three. The work is better than my son's grade five work. The quality is unbelievable."

(C) Depth of understanding of topic

Students were able to demonstrate to others a deep level of understanding of the topic. The principal, after having been led through the displays by several students, remarked, "It's easy to tell that they've learned a tremendous amount about bridges from the detailed explanations they gave. They could answer my questions in their own words, which shows me they've really thought about the subject and learned it well." Another parent related a story to Marie about her daughter's newly acquired expertise on tools. "Our house is under construction. It was funny when the windows

were being put in because Michelle said to us, "I know what that tool is." Her dad thought, "Oh, right!" Michelle then said, "It's a miter box" and she went on to explain how it's used. Her dad was so impressed. "She certainly knows a lot more than I do, that's for sure."

III. Additional Assessment and Evaluation Tools and Techniques for Project Work

In addition to the assessment and evaluation tools and techniques used in the "Building Project," many other possibilities exist for assessment and evaluation of children's project work. The assessment and evaluation tools and techniques selected for this study resulted from a combination of research and classroom practice. Searching for assessment and evaluation practices that could serve as possible assessment and evaluation tools and techniques during the Building Project, I read many books and articles on assessment and evaluation , as well as shared and collected assessment and evaluation materials and ideas with colleagues. The result was a list of over forty possible assessment and evaluation tools and techniques. Time and energy necessitated that both Marie and I be selective. It would have been impossible to have used all the assessment tools and techniques on the list.

Marie and I considered many factors when making our selections. We tried to choose tools and techniques that would allow us to assess and evaluate both process (anecdotal notes, learning logs) as well as product (criteria sheets, field notes chart, unit quiz); we wanted to have tools and techniques that we could use in each distinct phase of the project; we wanted to have a least one tool that could be used in all three phases(learning log) and we wanted tools and techniques that would encourage reflection (criteria sheets, quality work chart, project work plan, peer evaluation, portfolio reflection).

The process of selecting various assessment and evaluation tools and techniques meant that many other possibly equally effective and useful assessment and evaluation practices were not a part of this study. Now at

the end of the study and reflecting back on the Building Project, I can see that some of the assessment and evaluation tools and techniques not selected could prove very effective in assessing and evaluating children's project work. Having gone through the list, I've selected other possible assessment and evaluation tools and techniques that might be the most informative. This list is by no means exhaustive and should be considered as only a starting point. Many other valid assessment and evaluation practices exist. A brief list and description of additional assessment and evaluation tools and techniques for project work follows:

~ Drawings

Description-During Phase One, one way that children share their prior experiences and knowledge about a certain topic is through drawing. The drawings during this phase are from memory. During Phase Two and Phase Three the children engage in observational drawings. Observational drawings are detailed drawings of various objects related to the topic. The object is in front of the children and they have the opportunity to study it intensely . The drawings also include labels which identify the various parts of the object drawn. For example, during the "Building Project," the children made observational drawings of different types of tools and building materials that were on the display table.

Opportunities for Assessment and Evaluation-The drawings from Phase Two and Phase Three could be compared with the drawings from Phase One in order to highlight the development of a child's observational and recording skills as well as the growth of a child's knowledge about the topic. Helm, Beneke and Steinheimer (1998) stress the importance of displaying a child's narrative about his or her drawings along with the set of drawings to "heighten the viewer's awareness of the importance of the picture and draw the viewer's attention to the child's knowledge as revealed in the detail of the picture" (p. 87).

~Topic Web

Description-A topic web can be created by the class toward the end of Phase One. The class brainstorms all vocabulary and ideas that they already have about the topic of study and then sorts them into categories. The categories are then arranged in a web-like manner, glued into place and hung in the class. During Phase Two and Phase Three of the project, as more vocabulary and ideas are introduced they are added to the web.

Opportunities for Assessment and Evaluation-The vocabulary and ideas added during Phase Two and Phase Three could be written on colored paper different from those of Phase One and then added to the web. This way, the new knowledge learned during Phase Two and Phase Three would be easily identified. This activity could be done by the class as a whole in order to assess the class' growth concerning new vocabulary and ideas related to the topic and ability to categorize, or, each child could do a web during Phase One and then another web at the end of the project in order to assess each child's individual growth of vocabulary, ideas and ability to categorize.

~Questions

Description-Throughout the project the children are continuously encouraged to ask questions in order to expand upon their knowledge of the topic. Lists of questions can be charted, posted and used to determine appropriate activities, field site visits and guest visitors.

Opportunities for Assessment and Evaluation-The type of questions that children ask can indicate their understanding and/or misunderstanding of the topic as well as their listening skills. Teachers can make notes of the type of questions being asked at the beginning of the project and compare them with the type of questions being asked toward the end of the project. Are children's questions mainly seeking trivial information or do they demonstrate a desire for a deeper understanding, an attempt to make personal connections, a display of thoughtful insight? Once again, this activity can be done as a class or each child could do it individually.

~Questions Raised In Phase One

Description-Toward the end of Phase One the children are often asked to further brainstorm questions that they have about the topic of study. The questions reflect the children's interests. These questions play a fundamental role in determining the direction of the project. They are charted and used to determine the various activities, field site visits and guest visitors during the course of the project.

Opportunities for Assessment and Evaluation-Before beginning Phase Two of the project, the children could be given an opportunity to answer as many of the questions as possible. The activity could be done as a class or by each child. The answers are recorded and then at the end of the project the same questions are revisited. The children now have an opportunity to add information, change answers and answer questions they have previously left blank. Their responses would demonstrate some of the learning that took place during Phase Two and Phase Three of the project.

~Checklist of Observable Skills

Description-Teacher and children could develop a list of the skills that the children will be developing and the teacher will be assessing and/or evaluating. Each phase of the project would focus on specific skills. For example, skills could include the child's ability to:

Phase One
~listen and appreciate the ideas, contributions of others
~contribute ideas, suggestions, thoughts, opinions, insights to class discussions
~share previous experiences about topic
~share previous knowledge about topic
~choose and design a phase one activity

Phase Two
~listen and appreciate the ideas, contributions of others
~contribute ideas, suggestions, thoughts, opinions, insights to class discussions

~share new experiences about topic
~share new knowledge about topic
~record observations
~choose and design a phase two activity

Phase Three
~listen and appreciate the ideas, contributions of others
~contribute ideas, suggestions, thoughts, opinions, insights to class discussions
~share work and invite peer assessment
~make personal connections with new learning
~ask additional questions about topic
~self-assess and evaluate project work

Opportunities for Assessment and Evaluation-The teacher and children could assess and/or evaluate specified skills throughout the duration of the project. A checklist provides a quick and easy format to record assessment and/or evaluation data for each child. The teacher can quickly identify which skills the child still needs to develop and which skills are firmly in place.

~Phase One List of "Things We Think We Know About The Topic"

Description-Sometime during Phase One the class or each child can make a chart listing all the things they think they already know about the topic. The chart is hung in the classroom , or put in the portfolio. The validity of the information on the chart is not challenged at this time, but rather used for the selection of topics for class discussions.

Opportunities for Assessment and Evaluation-Toward the end of the project, the class or each child can revisit the list. Knowledge and experiences gained during the project will help the children determine the validity of their previous statements. The teacher and children could assess how well they were able to verify or deny previous statements and how much new information they can add to the list.

~Photographs

Description-Throughout the project, the teacher, parents, or even the children themselves can take photos of the children involved in various project activities.

Opportunities for Assessment and Evaluation-The old saying that a picture is worth a thousand words is very applicable here. A picture records many different aspects of an activity - the materials, the people involved, the location, and so on. Photos can be an excellent way of documenting learning. The teacher can simply jot a few notes down on the back of the photo to remind her/himself of the important details captured by the photo. Photos can then be shared with others to testify to student learning.

~Scribe Writers

Description-Older students can act as scribes for younger students by helping the younger students articulate their learning and then recording it in written form.

Opportunities for Assessment and Evaluation-When younger children aren't yet writing it is extremely difficult to ask them to represent their learning in written form. Although they have much to say, they aren't yet capable of writing it down. Older students can be wonderful scribes. They can write down the younger child's account of an experience, record his/her learning or simply jot down the retelling of a field visit.

IV. Final Reflection

My motivation for doing an in-depth study of assessment and evaluation in the context of project work arose from my desire to share with others the wondrous learning that students were displaying while actively engaged in project work in my classroom. Since having been introduced to the project approach three years ago, I have used project work extensively in my classroom as the primary vehicle for delivering curriculum. I have witnessed first-hand the level of commitment and excitement children exhibit as they go about selecting and shaping activities that meet their learning styles, interests and needs. Project work offers children the opportunity to demonstrate and share skills and abilities that are often overlooked in a more teacher-directed atmosphere. Each project that I've undertaken in my classroom has allowed me to discover both areas of strength and limitations in my students which have then helped me plan a more effective and appropriate program for our class.

However, knowing that others can be quick to describe project work as play, rather than just relying on my anecdotal stories and enthusiasm, I wanted to find and implement certain assessment and evaluation tools that could help me demonstrate and highlight the myriad of learning taking place during project work. The assessment and evaluation tools and techniques used in the Building Project were my attempt to demonstrate that project work is serious work. Curriculum objectives are being met and exceeded, high expectations are set and maintained and, most importantly, children are learning about themselves as learners.

It is my hope that this study will offer teachers already familiar with project work some ideas and insights on possible assessment and evaluation

tools and techniques, and, for those teachers skeptical about the merits of project work, some evidence that project work can be effectively assessed and evaluated.

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